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COMMERCIAL FISHERIES REVIEW



Joseph Pileggi, Editor
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5/31/68

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THE GUINEAN TRAWLING SURVEY

By Frank Williams*

INTRODUCTION

The original investigation for the exploration of the Gulf of Guinea (Guinean Year) as conceived by the Commission for Technical Co-operation in Africa (CCTA) in 1960 included:

1. an oceanographic program (for measurement of physico-chemical conditions, movements of water masses, productivity, etc.);
2. a trawling survey on the continental shelf;
3. an exploratory fishing survey for sardines (Clupeidae); and
4. an exploratory fishing survey for tunas and tuna-like fishes (Scombridae).

As is now generally known, the oceanographic investigation expanded into a study of the waters of the whole of the tropical Atlantic Ocean--the International Co-operative Investigations of the Tropical Atlantic (ICITA). Those investigations have been coordinated by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, and the three phases of the survey (EQUALANT I, II, and III) have now been completed. The exploratory fishing survey for sardines has so far been restricted to a small project started in Ghana by the Fisheries Biology Branch of FAO. However, it is hoped that a large-scale international survey of the sardine stocks will be initiated in the not-too-distant future. The exploratory tuna fishing survey, being conducted by the Bureau of Commercial Fisheries of the U. S. Department of the Interior, commenced in 1963 and will continue through 1965.

Of the original Guinean Year there remained to be carried out under the aegis of CCTA only the trawling survey which was renamed the Guinean Trawling Survey (GTS). The principal sponsor is the U. S. Agency for International Development (US/AID) with further direct financing from the United Kingdom Department of Technical Co-operation (UK/DTC).

PURPOSE

The purpose of the survey is to investigate the demersal fish potential of the West African continental shelf in relation to the environmental conditions.

AIMS

Within the area of operations the aims of the survey are:

1. To assess the qualitative and quantitative composition of the exploitable fish stocks.
2. To assess and ascertain the size composition of those species of fish of paramount commercial importance.
3. To compare productivity in different fishing areas.

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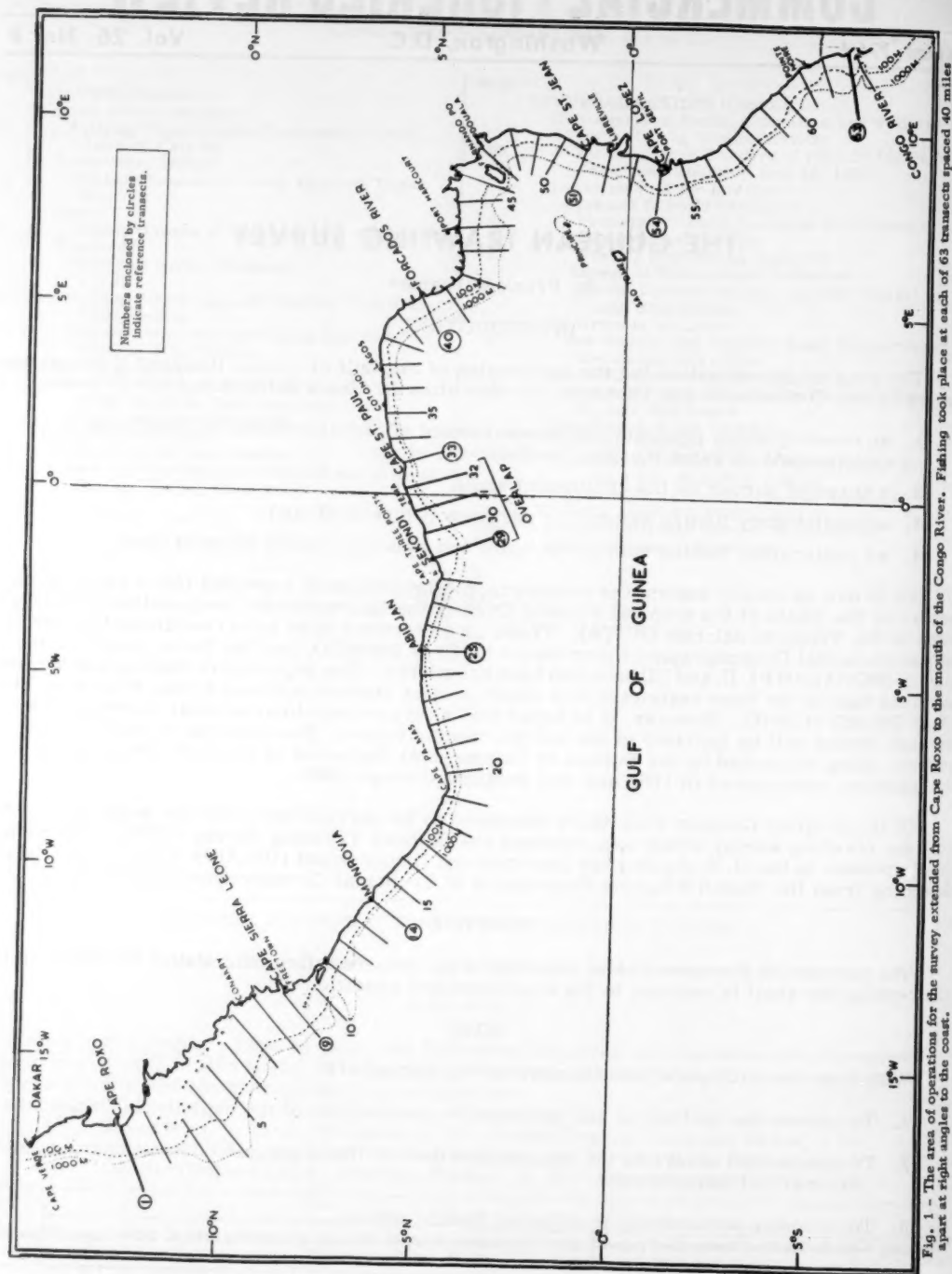


Fig. 1 - The area of operations for the survey extended from Cape Roxo to the mouth of the Congo River. Fishing took place at each of 63 transects spaced 40 miles apart at right angles to the coast.

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4. To relate 1, 2, and 3 to the hydrographic climate.
5. To locate areas which seem to be most favorable for commercial trawling in relation to depth, nature of ground, and availability of exploitable fish stocks.
6. To provide reference and study collections of fish of the area for those countries, organizations, institutes, and individuals desirous of receiving them.

AREA OF OPERATIONS

The area of operations extended from Cape Roxo (lat. $12^{\circ}30' N.$) to the mouth of the Congo River (lat. $6^{\circ} S.$), a distance of nearly 2,700 nautical miles (see fig. 1).

TIMETABLE

Preparatory Phase	September 1, 1962, to September 1, 1963.
Operational Phase	September 2, 1963, to June 15, 1964.
Report Phase	June 16, 1964, to August 31, 1965.

OPERATIONAL PHASES:

GUINEAN I	September 2, 1963, to December 20, 1963.
GUINEAN II	February 15, 1964, to June 15, 1964.

The timing of the survey was planned to coincide as closely as possible with the hydrographic seasons in the area. In the transition zones Cape Roxo to Conakry and Cape Lopez to the Congo River, there are two distinct seasons with a considerable temperature variation. The timing of the survey was such that trawling in those areas was carried out in the last 4-6 weeks of GUINEAN I and GUINEAN II and thus the two seasons were covered effectively. In the Equatorial Zone, Conakry to Cape Lopez, the hydrographic variations are not so great, except in the area of upwelling centered off the Ghana coast during July to September. Part of the period of upwelling was covered during the opening months of GUINEAN I, while normal conditions prevailed during GUINEAN II.

VESSELS

Two French trawlers were chartered for 13 months--June 15, 1963, to July 15, 1964, from Monsieur R. Sanquer of La Rochelle, France. The vessels--Thierry (fig. 2) of 230 tons and La Rafale of 200 tons--were 35 m.

(114 ft.) overall, with a beam of 7 m. (23 ft.) and a draft of 4.5 m. (14 ft.). Powered by 600-hp. main engines, the trawlers are fitted with hydraulic trawl winches carrying 1,800 m. (5,880 ft.) of 21 mm. $\frac{3}{4}$ -inch cable. The vessels were converted for scientific use and operations in tropical waters prior to leaving France for West Africa. The conversion included provision of a small laboratory, extra accommodations, mess, cold-rooms ($-20^{\circ} C.$ or $-4^{\circ} F.$ and $0^{\circ} C.$ or $32^{\circ} F.$), electronic log, additional echo-sounder, additional auxiliary engine, alternators for

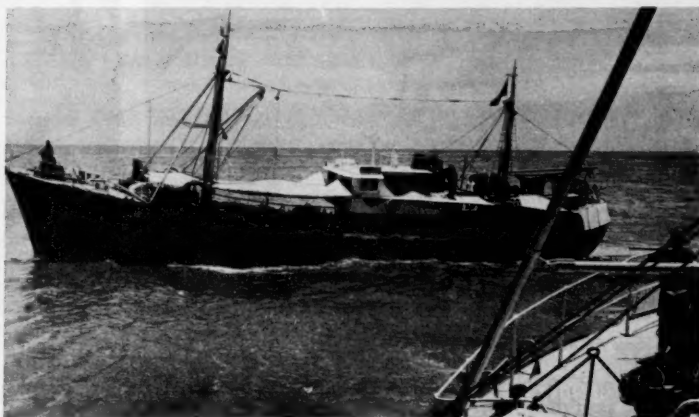


Fig. 2 - Trawler Thierry seen from the bridge of La Rafale.

a.c. current, air conditioning units, etc., and installation of a hydrographic winch on each vessel.

OPERATIONAL PLANS

Fishing took place at each of 63 transects spaced 40 miles apart at right angles to the coast from Cape Roxo to the Congo River (fig. 1). Eight stations were fished on each transect at the following depths: 15-20 m., 30 m., 40 m., 50 m., 70-75 m., 100 m., 200 m., 400-600 m. (8-10, 15, 20, 25, 35-38, 50, 100, 200-300 fathoms). To be able to estimate the difference in the fishing power of the vessels, during the first month of each operational phase 4 transects off the coast of Ghana were fished simultaneously twice by the two vessels. All routine trawling was carried out during daylight, but some night trawling was undertaken at selected stations. The fishing gear for the survey was standardized aboard the two vessels; the headrope size was 25 m. (80 ft.) and that of the cod-end mesh 40 mm. stretched ($1\frac{3}{8}$ inch). The cod-ends were made of nylon, the rest of the net of manila. Mesh measurements were made on cod-ends at set intervals using the I.C.E.S. mesh gauge.

SCHEDULE OF OBSERVATIONS

A continuous record of sea surface temperatures was made throughout the survey and notes were made on sightings of schools of fish, sea birds, drifting organisms, etc.

Before trawling began at each station, the following observations were made: bottom sampling; bathythermograph cast; reversing bottles for water samples for temperature; salinity, and oxygen at surface and bottom; meteorological and sea surface observations (ICITA style); Secchi disc; microbiomass; etc. The oxygen analyses were carried out on board the trawlers, while salinity samples were processed ashore at the Federal Fisheries Service, Lagos (Nigeria) and the Oceanographic Centre, Abidjan (Ivory Coast). The trawl hauls at all stations were each of one hour's duration, and all trawling was normally made with the current, following closely the requisite

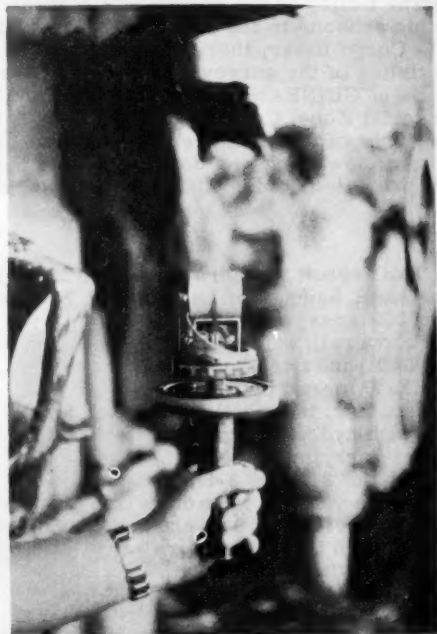
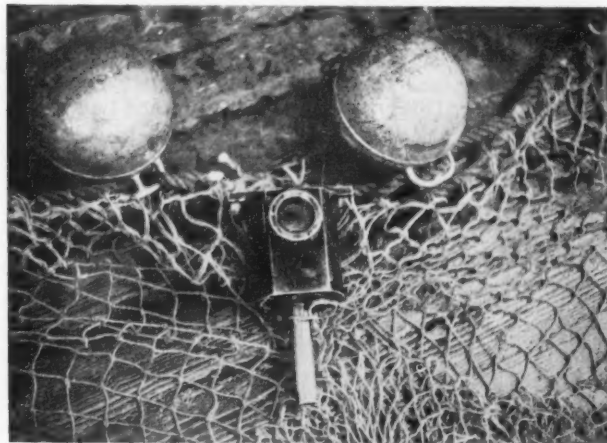


Fig. 3 - The independent trawl thermograph: (a) left--mounted on the head rope of the trawl; (b) right--with the pressure casing removed to show the recording drum.

depth contour. The water temperature at the mouth of the trawl net was recorded by an independent thermograph mounted on the headrope (figs. 3a and b).

The catches made by the trawl (figs. 4a and b, and 5) were sorted into the various constituent species, and the number and weight of each recorded. With large catches, random subsamples of the total catch were used for this purpose. For 12 commercially important

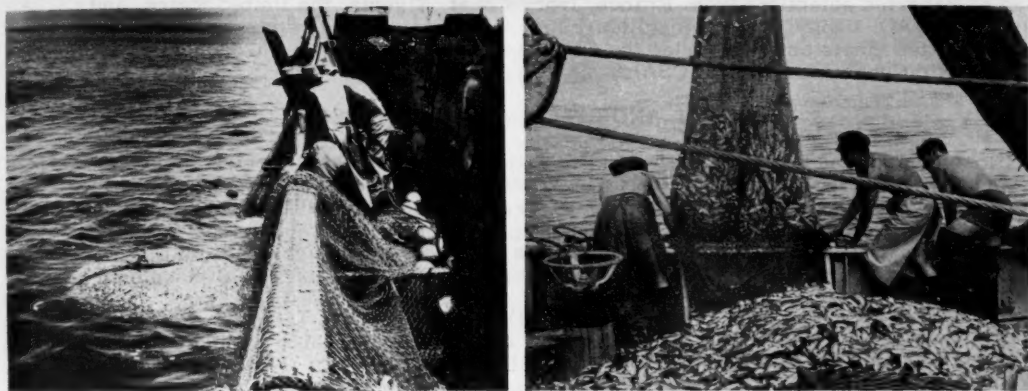


Fig. 4 - An exceptionally large catch made by the *La Rafale*, off the Ivory Coast (about 4 metric tons): (a) left--cod-end at the side of the vessel; (b) right--because of the weight of the catch, the cod-end was split and lifted in two sections. The small grunter (*Brachydeuterus auritus*) seen here formed about 90 percent of the catch.

species of fish, length-frequency measurements were made on random samples of 250 fish. Measurement of the various species of shrimp was based on the number of individuals per kilogram.

Comprehensive collections of fish and invertebrates of the West African continental shelf were made during the survey.

EQUIPMENT

Equipment for oceanography and fisheries to cover the agreed program as well as the more general items required by any scientific survey was provided. Three types of logbooks (hydrographic; general for trawl stations; fish-length frequencies) were designed and used by the survey.

Additional scientific equipment was provided by FAO, UNESCO, and the German Federal Republic.

SCIENTIFIC PERSONNEL

The scientific personnel on each vessel consisted of three biologists (one was cruise leader) and one hydrographer/biologist. The personnel were assigned to the survey by European countries and the United States under technical assistance agreements, West African fisheries research or oceanographic organizations, and international organizations. The countries and organizations represented included Belgium, France, German Federal Republic, Ghana, Ivory Coast, the Netherlands, the United States, and FAO. A total of 64 man-months of service was provided by those scientists.

FACILITIES IN WEST AFRICA

Facilities (e.g. housing, office, base port facilities, etc.) were granted by West African governments and CCTA.

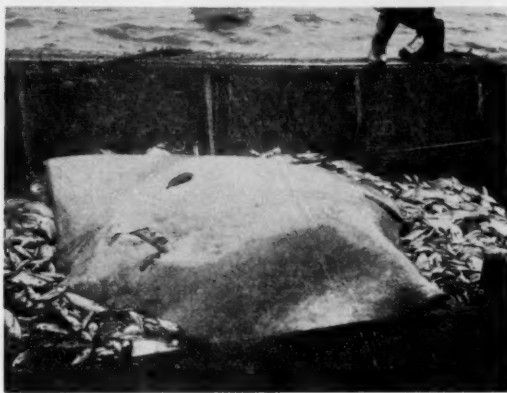


Fig. 5 - A stingray (*Dasyatis* sp.) taken by *La Rafale* off the Ghana coast. Length of body 6 ft., length of tail $7\frac{1}{2}$ ft., width across wings $7\frac{1}{2}$ ft., weight about 700 lbs. Sting rays up to 500 lbs. are not uncommon in West African trawl catches.

SCIENTIFIC COMMITTEE

The Director of the Guinean Trawling Survey is advised by a scientific committee composed of fisheries scientists from France, Ivory Coast, Nigeria, the United States, and CCTA. In addition, FAO, UNESCO, and other interested organizations are represented by observers. The committee meets annually under the Chairmanship of Professor Th. Monod, President of the Scientific Council for Africa (CSA).

REGIONAL AND INTERNATIONAL LIAISON

Close contact has been maintained between the survey and the fisheries and oceanographic laboratories in the West African area, in relation to local research and other programs being carried out by those organizations during the lifetime of the trawling survey.

In the international sphere, close liaison has also been maintained with the Fisheries Biology Branch of FAO and the Bureau of Oceanography and the IOC of UNESCO.

The National Oceanographic Data Center (NODC), Washington, D.C., has agreed to process the survey's hydrographic data for the West African continental shelf and publish them as ICITA supplementary data reports (GUINEAN I: EQUALANT II, and GUINEAN II: EQUALANT III). The Smithsonian Oceanographic Sorting Center (SOSC) Washington, D. C., has agreed to sort benthic samples collected by the survey. UNESCO, under a training scheme, is to provide a fish taxonomist at Abidjan to set up a temporary fish sorting center to (1) effect a basic breakdown of the survey's fish collections, and (2) train local West African staff in that task and also in the curating of collections.

PROGRESS TO DATE

During the whole period of GUINEAN I and II, fishing proceeded satisfactorily and all scheduled biological and hydrographic observations were made.


Two aspects of the results have been investigated so far:

1. Analysis has commenced of the results of the overlap transects for GUINEAN I and II (when the two vessels fished together for one month) to determine the degree of variation between the catch rates of the two vessels.
2. For GUINEAN I and II the catches of pelagic fishes caught in the trawls have been analyzed. Preliminary results show that considerable catches of sardine (Sardinella), mackerel (Scomber), scad (Trachurus), and mackerel scad (Decapturus) were made in many areas at depths of 30-100 m. (15-50 fathoms). Those findings are of great interest, especially in the view of the existing seasonal fisheries at the surface and the possible projected resources survey for those species in the West African area.

FUTURE

The methods for the Stage I analysis of the results (which mainly concerns data extraction from survey records) have been planned and three types of data forms printed. Stage II of the analysis and the publication of the final reports have also been considered, but those all depend to a certain extent on the results of Stage I.

The operational phases of the survey ceased in mid-June 1964. About the end of October 1964, it is hoped that the Director of the trawling survey will transfer his offices to the Biological Laboratory, U. S. Bureau of Commercial Fisheries, Washington, D.C., for the report and analysis period. It is expected that the survey report will be completed and sent to the printers towards the end of 1965. Progress reports will be issued at intervals during that period so that governments and the fishing industry in West Africa may be able to use information for future planning as rapidly as possible.



CHANCES IN ABUNDANCE OF THE MARINE WORM, GLYCERA DIBRANCHIATA, ASSOCIATED WITH SEAWATER TEMPERATURE FLUCTUATIONS

By Robert L. Dow*

Two species of marine annelids (worms) used as bait for salt-water sport fishing support the fourth most valuable fishery in Maine with a 1963 landed value of \$1.2 million.

The bloodworm, *Glycera dibranchiata*, has the highest landed unit value of any Maine marine resource. To the more than 900 licensees in 1963, bloodworms had a value of \$2.40 a pound. The sandworm, *Neanthes virens*, also hand-dug from intertidal growing areas during low tide, with a landed value of about \$1.10 a pound, has the second highest unit value.

Table 1 - Maine Production of Bloodworms, 1946-1963

Year	Number of Worms
	In Millions
1963.....	32.2
1962.....	25.7
1961.....	26.1
1960.....	24.2
1959.....	18.8
1958.....	13.6
1957.....	10.5
1956.....	7.5
1955.....	8.9
1954.....	10.6
1953.....	11.2
1952.....	9.2
1951.....	9.5
1950.....	13.7
1949.....	17.7
1948.....	25.0
1947.....	7.2
1946.....	2.6

Although worms are bought by dealers by the hundred, for statistical purposes such purchases are converted to pounds using a factor of 44 for bloodworms and 40 for sandworms.

Recent sampling has indicated that the average pound contains more than 50 sandworms or more than 100 bloodworms. Market acceptance of smaller sizes accounts for the increase in value per pound.

By reason of negligible winter markets and frozen or ice-covered intertidal areas, the fishery is limited to the March-November period. During the harvesting season, high demand encourages an intensive fishery; in the case of bloodworms, probably the most intensive fishery in Maine. Only since 1946 have landings of the two species been separated. Production of the bloodworm fishery by calendar years is listed in table 1.

Reasons for fluctuations in production suggested by the industry as well as by scientific investigators have ranged nearly as widely as landings themselves.

*Research Director, Maine Department of Sea and Shore Fisheries, State House, Augusta, Maine.



Fig. 1 - Digging bloodworms in intertidal area, Cod Cove, Wiscasset, Maine.

Restrictive legislation had rapidly increased from 1937 with the early beginnings of the fishery, only to culminate in complete repeal of all regulations by 1955. Regulations had curtailed the free-roving activities of commercial diggers, but it was three years after the effective date of repeal before there was any appreciable increase in landings.



Fig. 2 - Close-up of fisherman digging bloodworms.

Cyclic changes in the environment (Dow 1951, Dow and Wallace 1955), gradual changes in soil composition (Klawe and Dickie 1957), expansion of area fished (Dow and Wallace 1955), and changes in tidal exposure because of bridge and highway construction (Ganaros 1951) are other factors which have exercised relatively minor or local influence.

Dow and Wallace (1955) concluded that year-to-year fluctuations in production were indicative of short-term natural fluctuations in abundance. Klawe and Dickie (1957) concluded that bloodworm catches in Nova Scotia consist largely of three-year olds. Growing area conditions in Nova Scotia and Maine appear to be similar and observations made in Maine (Dow and Wallace 1955) agree with those of Canadian biologists.

Recent studies of Maine production and seawater temperatures as measured at Boothbay Harbor by the U. S. Fish and Wildlife Service suggest that abundance is determined primarily

by seawater temperature during the spawning year. Data presented in table 3 indicate an optimum annual temperature range of 47.0° to 49.0° F. during the year of spawning. Both higher and lower seawater temperatures are associated with substantial declines in worm landings.

These data are the only data which can be consistently used to account for fluctuations in abundance as indicated by commercial production. Deviations from high production levels between 47.0° and 49.0° F. which occurred in 1949 and 1950--although still higher than any other year outside the optimum range--can be accounted for by a bridge

Year	Number of Fishermen	Number of Worms In Millions
1963	921	32.2
1962	775	25.7
1961	729	26.1
1960	643	24.2
1959	784	18.8
1958	628	13.6
1957	640	10.5
1956	530	7.5
1955	551	8.9
1954	625	10.6
1953	522	11.2
1952	435	9.2
1951	324	9.5
1950	389	13.7
1949	498	17.7
1948	449	25.0

Year and Temp. in Declining Order	Temp. °F.	Number of Worms and Year Landed In Millions	
1953	51.9	7.5	1956
1951	51.5	10.6	1954
1954	50.2	10.5	1957
1955	50.1	13.6	1958
1949	50.1	9.2	1952
1952	50.0	8.9	1955
1950	49.6	11.2	1953
1957	49.0	24.2	1960
1947	48.5	13.7	1950
1956	48.5	18.8	1959
1960	47.8	32.2	1963
1958	47.3	26.1	1961
1946	47.2	17.7	1949
1945	47.0	25.0	1948
1959	47.0	25.7	1962
1948	46.7	9.5	1951
1944	46.5	7.2	1947
1943	45.3	2.6	1946

and causeway construction project in those two years which drastically reduced tidal exposure in one major producing area. Estimates made independently by both the industry and the Maine Department of Sea and Shore Fisheries of annual production losses resulting from this construction ranged from 25 to 30 percent.

How seawater temperature influences the abundance of bloodworms is not understood. It may be a direct relationship in terms of larval and juvenile survival, or it may be indirect through its influence on the amount of biological activity in the growing area. Klawe and Dickie (1957) observed that bloodworms apparently do not occupy sediments which are not sufficiently stable to support burrows.

Such conditions are frequently associated with increased organic activity during periods of high temperature. Conversely, during extremely cold winters greater ice overburden may create unfavorable sediment compaction in intertidal areas.



Fig. 3 - Packing bloodworms for shipment to dealers in bait for sport fishermen.

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Created in 1849 the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITIES IN BERING SEA:

Early May 1964: U.S.S.R.: During the second week in May 1964, the Soviet trawling fleet concentrated west of Yakutat began dispersing and moving to other regions nearer Kodiak Island. The main concentration, which assembled on the Portlock Bank (much as in past years), was estimated to include 86 trawlers, 16 freezerships, 2 factoryships, and a few support vessels. A smaller segment of the Soviet trawl fleet was operating west of Icy Bay in May 1964, and included approximately 30 trawlers, 3 freezerships, and 1 factoryship. The region south and west of Kodiak in the vicinity of Chirikof Island was exploited in May 1964 by a smaller Soviet trawling fleet composed of less than 5 trawlers and 1 freezership. Observations indicated that the Soviet fleets in the Gulf of Alaska were concentrating on Pacific ocean perch.



Fig. 1 - One type of Soviet factoryship operating in the North Pacific and Bering Sea. Length over-all about 150 feet with a speed of 10-12 knots.

The Soviet fleet fishing tangle nets for king crab continued to operate in the eastern Bering Sea in May 1964. That fleet consisted of 3 factoryships, each accompanied by twelve 40-foot picker boats and 2 SRT net-setting trawlers. The three Soviet king crab factory-

ships in the area were the Pavel Chebotnyagin operating north of Unimak Pass, and the Konstantin Sukhanov and the Vasiliy Blyukher, operating south of Hagemeister Island in outer Bristol Bay.

It is believed that two Soviet trawlers were still operating in May 1964 on the shrimp fishing grounds north of the Pribilof Islands and had been fishing in the area for over a month.

JAPAN: In May 1964, the shrimp factoryships Chichibu Maru and Einin Maru, each accompanied by 12 trawlers, continued to operate on shrimp grounds north of the Pribilof Islands.

During May, the Japanese tangle-net king crab fleet was reported to have been centered in outer Bristol Bay, north of Port Moller. That fleet consisted of 2 factoryships, the Tokei Maru and Tainichi Maru, each accompanied by 6 catcher vessels.



Fig. 2 - One type of Soviet trawler fishing in the North Pacific and Bering Sea.

The Fuji Maru No. 3, accompanied by 5 long-line fishing vessels, was believed to have been fishing in the region of the 100-fathom curve, southeast of the Pribilof Islands. The Kotoshiro Maru No. 25, with one accompanying long-line fishing vessel, presumably was

operating in the same area as the Fuji Maru No. 3 fleet.

The fish-meal factoryships Hoyo Maru and Gyokuei Maru, each accompanied by 30 trawlers, were operating in the eastern Bering Sea about 60 miles west of Amak Island.

Late May - Early June 1964: U.S.S.R.: During late May 1964, the large Soviet trawling fleet that built up off Yakutat had been shifting efforts between that area and the Portlock Bank region. As of early June, that fleet, estimated at 116 trawlers, 19 freezer-ships, 3 factoryships, 1 salvage tug, 1 tanker,



Fig. 3 - Japanese factoryship Tenyo Maru fishing in area west of St. Paul Island accompanied by 28 trawlers.



Fig. 4 - Washing silt and dirt from net loads of trawl-caught fish on the main deck of a typical Japanese factoryship.

The Tenyo Maru, accompanied by 28 trawlers, was reported fishing in the area west of St. Paul Island. The Tenryo Maru was reportedly fishing in the vicinity east of the Shumagin Islands. The stern-trawler Taiyo Maru No. 81 was located about 35 miles east of Cape Sitkinak, Trinity Islands.

Soviet and Japanese fishing activities in the Bering Sea continued into early June as follows:

and 2 cargo vessels, was again centered on Portlock Bank east of Kodiak. Observations and reports continued to indicate they were catching Pacific ocean perch with very small catches of other incidental species.

Soviet trawling effort appeared to be minimal in the area southwest of Kodiak, generally from Albatross Bank to Chirikof Island. A small fleet of about 4 trawlers and 1 reefer was fishing in that region.

The Soviet factoryship Konstantin Sukhanov and sisterships Pavel Chebotnyagin and Vasily Blyukher, each with at least two accompanying tangle-net setting trawlers, are continuing their operations on king crab in the Bering Sea north and east of Unimak Pass.

As of early June there was no confirmation that the two Soviet trawlers were still engaged in a shrimp fishery north of the Pribilof Islands. It was presumed that fishery might have been terminated.

JAPAN: Shrimp Fishery: The shrimp factoryships Chichibu Maru and Einin Maru, each accompanied by 12 trawlers, continued to operate on the shrimp grounds north of the Pribilof Islands. As of mid-June the side

trawler Tenryu Maru was believed to be still fishing for shrimp west of the Trinity Islands, southwest of Kodiak.

King Crab Fishery: The Japanese tangle-net fishery for king crab was reported to be centered in outer Bristol Bay, north of Port Moller. That fleet consisted of 2 factory-ships, the Tokei Maru and Tainichi Maru, each accompanied by 6 catcher boats.



Fig. 5 - Sorting and weighing king crab meat prior to freezing aboard a Japanese crab factoryship.

Long-Line Fishery: Japanese press translations reported, the factoryship Fuji Maru No. 3, specially chartered to fish for halibut in the Area 3B North Triangle, was to return to Japan in late May and her five accompanying long-line vessels were to join the Seifu Maru fleet. Neither the Fuji Maru No. 3 nor the other Japanese halibut fishing fleet of the Kotoshiro Maru No. 25 and one accompanying long-line vessel were sighted during early June. It appeared likely that the Japanese disbanded their halibut fishing venture because of very poor fishing.

Fish Meal: The Japanese fish meal factoryships Hoyo Maru and Gyokuei Maru, each with 30 accompanying trawlers, were operating on the "flats" of outer Bristol Bay northwest of Port Moller. Other fleets licensed by the Japanese for fish meal, oil, and solubles production operating in the eastern Bering Sea the early part of June were the Tenryo Maru with 28 trawlers still working in the area northwest of St. Paul Island and the Soyo Maru and Seifu Maru each with 28 trawlers fishing just north of Unimak Pass. All 5 of those factoryships freeze selected portions of their catches for human consumption.

Whaling: Of the 3 whale factoryships which reportedly departed Japan on May 20 only one was sighted. The Kyokuyo Maru, probably

accompanied by 7 whale killers, was operating near Amchitka Pass in the western Aleutians. Another of the fleets, possibly the Nitto Maru, was expected to appear in the Gulf of Alaska region between Kodiak and Dixon Entrance.

"Exploratory" Fishing Activities: The Japanese factory stern trawler Taiyo Maru No. 81 was last sighted about 70 miles west of Middleton Island in the central Gulf of Alaska. This vessel was primarily seeking Pacific ocean perch and was reportedly been experiencing good catches.

A second Japanese stern factory trawler in the Gulf, the Akebono Maru No. 51, moved from the Shumagin Islands region eastward into the area about 40 miles west of the Trinity Islands, southwest of Kodiak. Japanese "exploratory" efforts in 1963 reported sizeable catches of sidestripe and pink shrimp--the main species sought by that vessel.

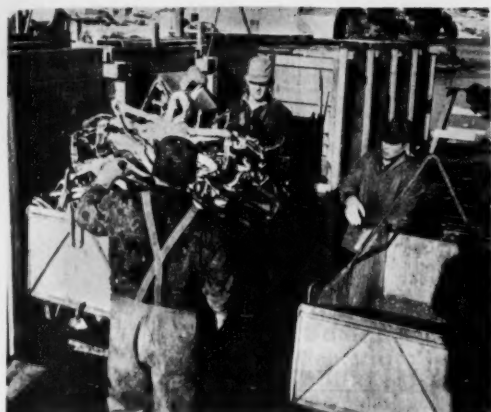
Groundfish Freezing Fishery: The stern factory trawler Ibuki Maru and one accompanying smaller side trawler were licensed by Japan to engage in the groundfish fishery of the Bering Sea in 1964. About early June this vessel appeared north of Amchitka Pass in the western Aleutians. It was believed that the bulk of catches made by both vessels was being frozen aboard the factory trawler.

Note: See Commercial Fisheries Review, June 1964 p. 9.

PLANS OF KING CRAB PROCESSORS:

A number of Alaska's seafood processors plan to rebuild following the March earthquake. One processor, whose plants suffered little direct damage due to the earthquake and tidal waves, must raise his shore plants at Port Wakefield and at Seldovia due to land subsidence. A King crab operator at Kodiak plans to replace its shore plant there with facilities aboard a 160 x 60 foot barge. That firm does not plan to rebuild its Shearwater salmon cannery, but will maintain a company store and gear storage at the old Shearwater cannery site. Another firm plans to rebuild its plant at Kodiak but details were not yet available. Two other king crab plants damaged by the earthquake were back in production by the end of May, but the crab supply was limited. A shrimp processing plant resumed its production of shrimp logs.

Other developments in Alaska's king crab fishery indicated significant expansion west



Unloading king crab at a cannery in Kodiak before the March 1964 earthquake.

of Kodiak. One major processor plans to convert from canning to freezing in the Shumagin Islands area. Significant new fisheries have developed on the Slime Bank in the Bering Sea and in waters surrounding Unalaska Island.

NEW BARGE FACILITY AT KETCHIKAN BEING BUILT:

A contract was awarded in May to a building firm for construction of a highly versatile barge docking installation at Ketchikan and Northern Terminal Company's \$1.5 million rail-water terminal and industrial park at Ketchikan in Southeastern Alaska.

The new facility will be parallel to the Company's modern rail-barge basin and transfer span and will accommodate barges up to 200 feet in length. Rail trackage will be extended onto the new dock and a large ramp to the inshore end of the basin will provide full roll-on, roll-off capabilities.

As a result handling of cargo will be greatly facilitated on freight moving through the terminal to or from Southeastern Alaska points. Such commodities as lumber, ores, and canned salmon may be transferred by crane directly from a barge to a railcar for shipment to markets in the other states. Work was scheduled for completion July 1, 1964.

HERRING ROE READIED FOR SHIPMENT TO JAPAN:

The first 1964 shipment of herring roe to Japan was reported to be about 10 tons. The roe will be brine-cured and shipped to Japan in boxes where it will be placed on the domestic market. The product was being handled by a subsidiary of a leading Japanese fishing firm. The fishing and primary processing of the catch was to be done in Alaska by Alaskans.

GEAR COUNT FOR SOUTHEASTERN ALASKA REGISTERED FISHING VESSELS:

A gear count has been completed for Southeastern Alaska purse-seine and gill-net vessels registered for 1964. The purse-seine gear count shows that gear is equally divided between residents and nonresidents and the number increased by 2 over the past 3 years. Gill-netting is down somewhat over the past three years.

Registrations for 1964 as compared with prior years are:

Purse Seine:

1964	.....	resident 243; nonresident 243; total 486.
1963	.....	resident 252; nonresident 232; total 484.
1962	.....	resident 247; nonresident 250; total 497.
1961	.....	resident 245; nonresident 206; total 451.

Gill-Netting:

1964	.....	resident 204; nonresident 166; total 370.
1963	.....	resident 287; nonresident 164; total 451.
1962	.....	resident 242; nonresident 168; total 410.
1961	.....	resident 251; nonresident 169; total 420.

Gill-net fishing opened in the Taku-Stikine area April 27 and was scheduled to open in Portland Canal on June 14 and Red Bay-Lake Bay and Lynn Canal on June 15.

LOW INTEREST RATE LOANS AVAILABLE TO FISHING INDUSTRY:

Emergency loans from the Fisheries Loan Fund of the U. S. Bureau of Commercial Fisheries have been made at an interest rate of 3 percent to fishermen who had fishing vessels or gear lost or damaged in the Alaska earthquake and resulting tidal wave. Applications for loans of that type at this interest rate will be accepted by the Bureau until September 30, 1964.

DENIAL OF PETITION FOR REHEARING ON ALASKA STEAMSHIP SEASONAL CARGO RATES:

The Federal Maritime Commission has ruled that the Alaska Steamship Company must lower its rates by about 2.7 percent to 6.4 percent in the seasonal Alaska trade to avoid receiving a rate of return in excess of 10 percent.

The Alaska Steamship Company had increased rates in late 1961 by 10 percent on general cargo to seasonal areas of Alaska, 20 percent on cannery supplies to Alaskan salmon cannery, and 10 percent on salmon cannery products southbound. The Commission started an investigation of the rates in January 1962. In a decision dated March 5, 1964, the tariffs were ordered amended to bring the Alaska Steamship Company a rate of return not in excess of 10 percent in the seasonal service.

The Alaska Steamship Company petitioned the Commission for rehearing of the proceeding, contending that the rate base used by the Commission was not proper. The State of Alaska and the General Services Administration supported the Commission's decision. The Commission denied the petition for rehearing on May 13, 1964, thereby making the decision final. The denial carried with it specific increases. The Commission said it would allow 3.6 percent and 7.3 percent northbound on general cargo and salmon cannery supplies, respectively, and 3.6 percent southbound on salmon cannery products.

Although salmon cannery traffic accounts for over 90 percent of the traffic moving under the contested rates, no Alaska salmon cannery took part in the proceeding. The U.S. Bureau of Commercial Fisheries participated, but took no position.



Alaska Fisheries Exploration and Gear Research

CHARTERED EXPLORATORY VESSEL BEGINS ACTIVITIES:

The chartered exploratory fishing vessel Paragon arrived in Juneau on May 24, 1964, to begin a 4-months charter period to the U.S. Bureau of Commercial Fisheries for exploratory fishing in the area from Kodiak Island westward. After departing Juneau on May 25,

the vessel proceeded en route to Kodiak. Radio-telephone communication the following day revealed that the vessel had struck a "log" and that some damage resulted to the main engine cooling system. She was later "beached" at Port Wakefield when repairs were made to the cooling system. Later reports indicated the Paragon was conducting underwater television experiments in the Kupreanof-Rasperry Straits area of Kodiak Island.



American Samoa

EX-VESSEL PRICES FOR TUNA:

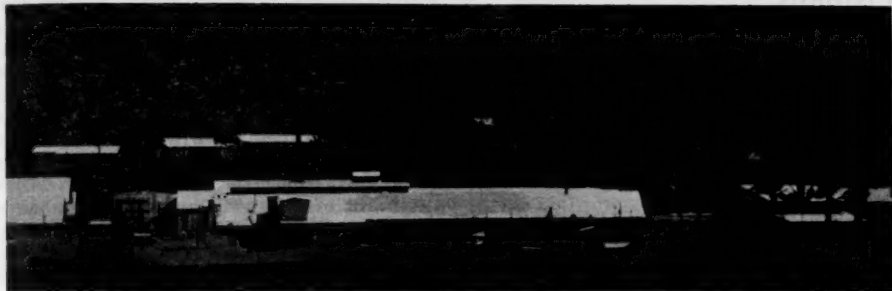
The Japanese trading and fishing firms which have been negotiating tuna ex-vessel prices with the United States tuna packing



firms located in American Samoa reached an agreement in mid-May 1964. Prices agreed on are as follows (in short tons): frozen albacore \$325; iced albacore \$310; frozen gilled-and-gutted (head on) yellowfin \$275; frozen dressed (gilled-and-gutted, head and tail off) yellowfin \$285; iced small (20-80 lbs.) round yellowfin \$250; iced medium (80-100 lbs.) round yellowfin \$210; iced large (over 100 lbs.) round yellowfin \$170. (Suisan Tsushin, May 18, 1964.)

JAPANESE FISHING FIRM TO CHARGE HANDLING FEE FOR DELIVERIES TO CANNERY:

One of Japan's leading fishing companies began on July 1, 1964, to assess a flat fee of 8 percent on tuna that it handles for delivery to a United States tuna packing company on American Samoa. Previously, the Japanese fish-



Tuna cannery on American Samoa operated by a United States west coast tuna canning firm.

ing company had bought the fish directly from Japanese fishing vessels operating out of American Samoa and resold them to one of the American canneries on the island. (Suisancho Nippo, June 1, 1964.)

ULO

California

SEA OTTER POPULATION DETERMINED BY CENSUS:

An aerial survey of California's sea otter population, made in February 1964, disclosed there are at least 396 of the animals, the California Department of Fish and Game announced in June 1964. The census, taken in the Department's twin engine Beechcraft N5614D, was made at heights of 50 to 150 feet, and visibility was excellent.

The sea otter census was conducted along the coastline between Morro Bay and Monterey Bay. It was the third of three flights planned for the census and was reported to have resulted in the best sea otter count of the three flights.

This year's (1964) census of 396 sea otters is substantially below the 638 figure recorded in the last official census taken in 1957. The Department pointed out that natural mortality does take a toll regularly, because sea otters are very susceptible to injury from a rough surf and from their natural enemies--white sharks and killer whales. The 1964 census of a minimum of 396 animals does point out, however, the necessity of continued protection of that valuable animal because it is not yet present in large enough numbers to guarantee survival, the Department stated.

Sea otters are protected by State law within the 3-mile limit and by Federal law outside the 3-mile limit.

Note: See Commercial Fisheries Review, May 1964 p. 13, April 1964 p. 12.



Cans

SHIPMENTS FOR FISHERY PRODUCTS, JANUARY-APRIL 1964:

A total of 840,463 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-April 1964, an increase of 2.6 percent over the 819,096 base boxes used during the same period in 1963.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14"x20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

NEW EASY-OPEN ALUMINUM CAN DEVELOPED FOR MAINE SARDINE INDUSTRY:

A good portion of the United States 1964 Maine sardine pack will go to market in a new easy-open aluminum can, according to the Maine Sardine Council. In overall appearance, the new can closely resembles the standard rectangular sardine can, but the cover is equipped with a tab that embodies the features of the lift-tab beer can and the easy-opening citrus concentrate can. (Canning Trade, June 1, 1964.)



Caroline Islands

COMMERCIAL FISHERIES PROJECT AT PALAU MAKES HEADWAY:

Construction of a commercial fisheries project at Palau, in the Caroline Islands Group of the United States Trust Territory of the Pacific, has been under way this past year. In April 1964, material and equipment for building a cold-storage freezer plant and other facilities connected with the project arrived in Palau. The project was initiated in 1963 under an agreement with a United States west coast tuna canning firm as a major step toward large-scale development of a commercial fishery--the most important natural resource of the Trust Territory.

In a statement to the Trusteeship Council in May 1964, the High Commissioner of the Trust Territory gave a resume of significant economic events in that area. It included developments toward the establishment of a commercial fishery which could well lead to similar enterprises in other districts of the Territory, and thus stimulate the local economy through increased employment and a higher level of income.

The High Commissioner said that one of the provisions of the agreement with the United States firm calls for the training of Micronesians as tuna fishermen and in the installations ashore where it is anticipated that some 60 or more Micronesians will be employed in the initial phases. Six 25-ton tuna vessels were being built and were expected to begin operating from Koror in Palau by July 1, 1964. Initially 48 Micronesians were to be employed as crew members. Local contractors in Palau participated in the construction of a living quarters building to house some 120 tuna fishermen. Other facilities to be built or installed include a 1,500 ton fish-storage freezer, ice-making machines, water storage tanks, offices, and houses for technical and management staff.

The Trust Territory Administration continued to send trainees to Hawaii to learn live-bait tuna fishing. As of May, some 23 trainees were undergoing training on tuna vessels operating out of Hawaiian ports and others will be given similar opportunity. The High Commissioner said it is from that group of trainees that they hope to develop a nucleus of experienced tuna fishermen which can, in turn, train other Micronesians at the local level.

Most of the pilot projects in local fisheries development have, up to now, been concentrated in Palau. With the establishment of a large-scale commercial fisheries venture in Koror, it is now proposed to establish a pilot fisheries project in the Truk District. This will permit the transfer of the major fisheries development effort to Truk where initial emphasis will be given to the development of a fishing industry capable of supplying all local demands for fresh fish. A Fisheries Officer of the Trust Territory will still remain in Palau to supervise the fisheries program but at that stage it is felt that major emphasis must be given to the establishment of fishery facilities in Truk, the Territory's largest district. Recruitment of additional fisheries development personnel is also being planned for the coming year.

Boat building operations in Palau were reported being increased. The Palau Boat-builders Association during the year completed and sold more than a dozen vessels while an additional 15 vessels are on order. The Palau Boat Yard has been established as a Government pilot project under the Administration Boat Builder and this past May had under construction a 75-foot live bait tuna vessel for the local fisheries project. The Palau Boat Yard will also be used as a training center for advanced training for boat-builders from all over the Territory. (Press Release of U. S. Mission to the United Nations, May 28, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 85.



Central Pacific Fisheries Investigations

BEHAVIOR STUDIES OF LITTLE TUNA:

Swimming speed of little tuna decreases over a 5-day period of food deprivation only to increase again after a meal, it was observed in behavior studies made by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii. The density of their food is greater than sea water and following a meal the weight of the whole fish in water increases. This increase in speed and weight in water are apparently associated mechanically with the increased speed resulting in an increase in lift from the pectoral fins, and therefore a compensation for the increase in weight. These data plus data on the occurrence of gas bladders in scombrid species with different maximum attained weights

were presented to the Hawaiian Academy of Science.

The visual acuity of two humans were measured under the same conditions as previously collected data on little tuna and skipjack. When the visual stimulus has a brightness of 1 foot lambert, visual acuity is 0.11 for little tuna, 0.15 for skipjack, and 0.30 for man with a face plate. This means that man can see an object $\frac{1}{3}$ and $\frac{1}{2}$ the size that can be seen by little tuna and skipjack, respectively, under the same conditions. These data have not yet been corrected for the distortion of the image by the water column.

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TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

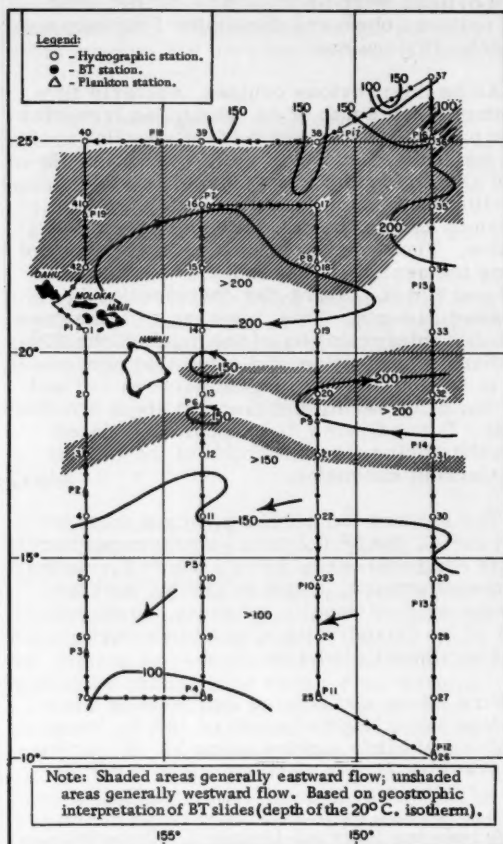
M/V "Townsend Cromwell" Cruise 3
(April 12-May 4, 1964): To determine the rates of change in the distribution of properties in the trade wind zone of the central North Pacific was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell. The cruise was the third in a series of oceanographic cruises designed to investigate the relationship between wind and ocean currents.

A total of 42 oceanographic stations were occupied along the cruise track as shown in chart. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters.

Bathymetographs (BT) were obtained at 20-mile intervals along the cruise track. Between stations 19 and 21, 26 and 28, 35 and 37, BT casts were made at 10-mile intervals. Surface bucket temperatures and water samples for salinity analysis were obtained at each bathymetograph observation. BT data were coded and transmitted four times daily to Fleet Numerical Weather Facility, Monterey, Calif.

At station 24, subsurface currents were measured, using an Ekman meter, while drifting relative to a parachute drogue set at 1,200 meters.

Ten plastic enclosed drift cards were released at 30-mile intervals along the entire cruise track and standard marine weather observations were made and transmitted daily at 0000, 0600, 1200, and 1800 G.M.T. Radiation from sun and sky was measured and re-



flow pattern were undergoing a change from the patterns observed during the February and March 1964 cruises.

As on the previous cruises, westerly flow predominated south of 18° N. and an irregular flow pattern existed north of 18° N. However, the pronounced eddy west of the island of Hawaii and a larger counterclockwise eddy encircling that Island (present during the two previous cruises) were not apparent on this cruise. The most significant change occurred along the sections 148° and 151° W. between 15° and 20° N. Here the thermocline increased in depth. This, together with the geostrophic interpretation of the depth of the 20° isotherm distribution, indicates that new water is feeding into the region between 15° and 20° N., progressing westward at about 6 miles a day. It is believed that this is associated with the spring intensification of the California Current Extension.

The surface temperature ranged from about 26° C. (78.8° F.) in the southern portion of the cruise area to 21° C. (69.8° F.) in the northeast portion. South of 16° N., the isotherms aligned zonally, whereas, north and east of the Islands they aligned in a northwest-southeast direction.

Bird flocks and related fish schools were predominantly sighted south of 13° N. Large numbers of birds sighted along 25° N. during the previous cruise were not sighted during this cruise.

A two-day interval (April 18-20) during this cruise period was spent at Hilo, Hawaii, to conduct a ship's open house and educational exhibit.

Note: See *Commercial Fisheries Review*, July 1964 p. 10, May 1964 p. 13.

OCEANIC EDDIES SOUTHWEST OF HAWAIIAN ISLANDS STUDIED:

M/V "Charles H. Gilbert" Cruise 72-- PHASE I (April 14-21, 1964); PHASE II (May 16-23, 1964): Oceanic eddies in an area southwest of the Hawaiian Islands were studied on this cruise by the research vessel Charles H. Gilbert, operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The cruise was conducted as two separate phases, each lasting about eight days.

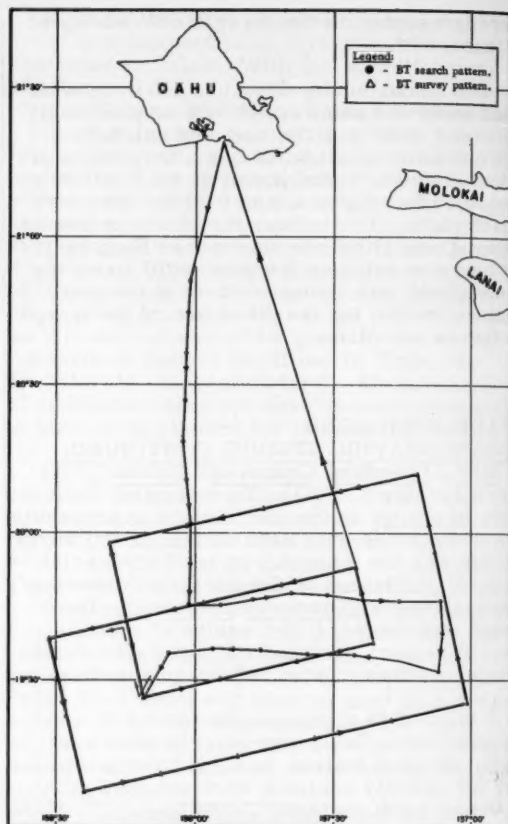


Fig. 1 - Phase I of M/V Charles H. Gilbert Cruise 72, April 14-21, 1964.

During Phase I of the cruise, a large eddy with a radius of about 70 miles was located due west of the island of Hawaii and due south of Oahu. Its position and thermal structure was studied as planned until engine trouble ended the Phase I portion of the cruise. Salinity samples were collected with each bathythermograph (BT) observation.

No drift cards were released during Phase I due to its premature ending.

During Phase II, the eddy which was studied during Phase I could not be located, although a thermal dome was encountered about 60 miles southwest of Oahu. A study was carried on in the area where the eddy may have moved since Phase I. BT observations were made every hour and salinity samples

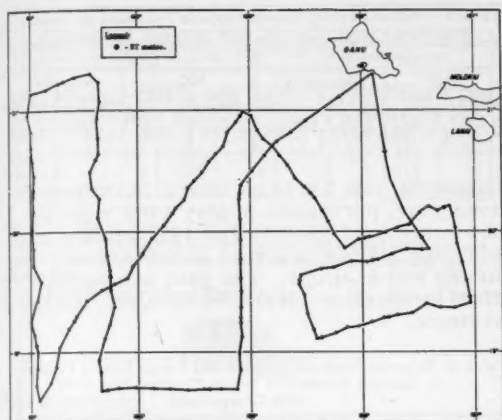


Fig. 2 - Phase II of M/V Charles H. Gilbert Cruise 72, May 16-23, 1964.

obtained with each BT. A rerun of the pattern of BT observations was made in about the same locations as Phase I. Preliminary studies of the two patterns showed no resemblance of thermal topography in that area.

A total of 420 drift cards and 157 drift bottles were released during Phase II.

A watch was kept for fish schools and bird flocks during both phases. A considerable large number of birds were seen, but the fish schools could not be identified.

During both phases the thermograph and barograph were operated continuously, and standard marine weather observations were transmitted four times daily.

Two lures were towed during daylight hours. The total catch consisted of 2 mahimahi (Coryphaena hippurus), 2 yellowfin tuna (Neothunnus macropterus), and 1 wahoo (Acanthocybium solandri).

Note: See Commercial Fisheries Review, August 1963 p. 21.



Clams

NEW LABORATORY HOLDING METHOD:

A new method for holding soft-shell clams in laboratory tanks is employed by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine. A square wooden frame covered with an 8-inch mesh saran screen is used. The screen is

cut into slits, each large enough to hold one clam upright. The tension on the screen provides support for the clam valves, helping to hold them closed.

The advantages of the method are: (1) clams are held in a natural upright position to permit siphoning observations or measurements; and (2) support is provided for the valves, and relaxation for the adductor muscles without burying the clams in mud or sand.

Preliminary results have been satisfactory, and clam survival is being observed in comparative studies of the new holding equipment and the usual alternatives of holding clams free on tank bottoms or buried in sand.



Crabs

EFFECTS OF CERTAIN PYROPHOSPHATES ON MOISTURE RETENTION IN CANNED KING CRAB:

The U. S. Bureau of Commercial Fisheries Technological Laboratory, Ketchikan, Alaska, is conducting a short applied study of the effects of pyrophosphates on moisture retention by canned king crab. (The National Canners Association is studying polyphosphates from the standpoint of struvite control.) Three experiments have been completed. Sodium acid pyrophosphates and sodium tripolyphosphate were used in concentrations ranging from 0.15-0.59 percent (with respect to P_2O_5) expressed as a percentage of the fill weight of crab meat. The polyphosphates to be added were included in a brine solution totaling about 50 grams. Other variables under consideration are the pH of the polyphosphate solution, sodium chloride level, and the initial cooking procedures necessary for proper shucking and color retention of the king crab meat.

Preliminary results suggest that polyphosphates used in amounts similar to those proposed for control of struvite in canned king crab can reduce shrinkage during retorting but do not cause the crab meat to absorb additional water. Additional experiments have been planned to verify earlier results and suggest whether the experiments should be continued further.



Federal Aid for Sport Fish and Wildlife Restoration

INTERIOR APPORTIONMENTS FUNDS TO STATES FOR FY 1965:

A preliminary distribution of \$14.2 million in Federal-aid funds for fish and wildlife restoration projects was made available to the states on July 1, 1964. Secretary of the Interior Stewart L. Udall announced on June 4, 1964. This is an increase of \$1.6 million over a similar distribution a year earlier.

Of the \$14.2 million allocated so far this year, \$10.9 million is for wildlife restoration and \$3.3 million is for sport fishing projects. The preliminary apportionments enable states with small reserve funds to finance their Federal-aid operations from July 1 until the final apportionment for the year which comes in the fall.

Fish and wildlife restoration funds come from Federal excise taxes collected from manufacturers, importers, and producers of certain types of hunting and fishing equipment. Distribution of the funds is based on the number of paid license holders in a state and on the state area. The Federal Aid in Fish and Wildlife Restoration programs are administered by the Interior Department's Bureau of Sport Fisheries and Wildlife.

Under the Federal-aid programs, states spend their own funds on approved projects and are reimbursed for up to 75 percent of the cost. The laws establishing the programs also provide \$10,000 each for Guam, Puerto Rico, and the Virgin Islands. The total 1965 Fiscal Year apportionment for those areas is included in the July 1, 1964, preliminary apportionment.

Note: See *Commercial Fisheries Review*, July 1963 p. 36.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1964:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in May 1964 than in the previous month. The increase was 27.5 percent in quantity and 24.4 percent in value.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, May 1964 with Comparisons

QUANTITY				VALUE			
May		Jan. -May		May		Jan. -May	
1964	1963	1964	1963	1964	1963	1964	1963
2,211	1,752	10,735	9,854	1,123	938	5,581	5,695
..... (1,000 Lbs.) .....				..... (\$1,000)			

Compared with the same month in the previous year, purchases in May 1964 were up 26.2 percent in quantity and 19.7 percent in value due mainly to larger purchases of shrimp and scallops. The gain was partly offset by smaller purchases of most fish fillet items.

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, May 1964 with Comparisons

Product	May		Jan. -May	
	1964	1963	1964	1963
..... (Pounds)				
Shrimp:				
Raw headless	109,700	1/	524,350	1/
Peeled and deveined	101,262	1/	377,470	1/
Breaded	399,450	1/	1,853,550	1/
Total shrimp	610,412	450,965	2,755,370	2,509,969
Scallops:	483,750	169,851	1,394,100	945,819
Oysters:				
Eastern	51,070	1/	402,490	1/
Pacific	12,044	1/	105,164	1/
Total oysters	63,114	66,832	507,654	498,699
Clams	4,675	20,414	141,533	119,584
Fillet:				
Cod	23,850	61,888	196,616	299,941
Flounder and sole	196,000	266,292	510,816	1,533,824
Haddock	185,390	197,504	2,862,814	1,046,574
Ocean perch	275,800	327,352	1,523,020	1,661,972
Steaks:				
Halibut	104,927	111,882	528,722	612,480
Salmon	25,652	19,570	90,629	89,495
Swordfish	810	2,642	6,820	13,872

1/Breakdown not available.

2/Includes 8,650 pounds of haddock portions.

Total purchases in the first 5 months of 1964 were up 8.9 percent in quantity from those in the same period of 1963, but down 2.0 percent in value because of generally lower prices. In January-May 1964, there were larger purchases of shrimp, scallops, and clams, but noticeably lower purchases of cod fillets, haddock fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Canned: In the first 5 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 54.0 percent in quantity and 58.6 percent in value from those in the same period of the previous year. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, May 1964 with Comparisons

Product	QUANTITY				VALUE			
	May		Jan.-May		May		Jan.-May	
	1964	1963	1964	1963	1964	1963	1964	1963
	(1,000 Lbs.)				(\$1,000)			
Tuna	383	465	1,842	1,463	170	217	815	723
Salmon	-	8	679	14	-	5	416	9
Sardine	20	53	127	242	49	22	90	101

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, July 1964 p. 11.



Fish-Farming

LABOR-SAVING GEAR TESTED IN RICE-FARM PONDS:

Several types of fishing gear new to inland fish farmers were successfully tested in rice-farm fish ponds near Dumas, Ark., in early 1964 by U.S. Bureau of Commercial Fisheries technicians.

A 2,000-foot nylon haul seine successfully harvested nearly 5,000 pounds of buffalofish and an undetermined number of small crappie in one haul from a 39-acre pond. The catch was estimated to include 50 percent of the buffalofish known to be stocked in the pond. An elevator-conveyor belt designed to move the fish catch from the net to a waiting truck also proved successful when the net was emptied of the 2.5-ton catch in about 1 hour.



Fig. 1 - This labor-saving method of removing buffalofish from a rice-farm fish pond by means of a fish elevator was successfully demonstrated to local fish farmers.

In another series of tests, slat traps were set in a fish pond to determine their effectiveness

for catching a relatively small number of catfish for marketing on short notice. Daily lifting of the traps indicated two factors which apparently affect the catch rate of the trap gear. One is the effect of movements of local weather frontal systems, and the other is the decoying effect of captured catfish attracting others to the same trap. One catch of 121 pounds of channel catfish made during a 48-hour set emphasized the decoying effect. Over one-half of the fish were taken from 1 of the 10 traps set, and it was jammed so full that 1 more fish could not have forced through the opening. Such behavior is successfully used in other fresh-water fisheries to improve gear efficiency. The reactions of catfish will be studied further during future slat-trap operations.



Fig. 2 - Catfish in a rice farm fish pond are being concentrated in a small area with a seine-type gear preparatory to removing them from the pond.

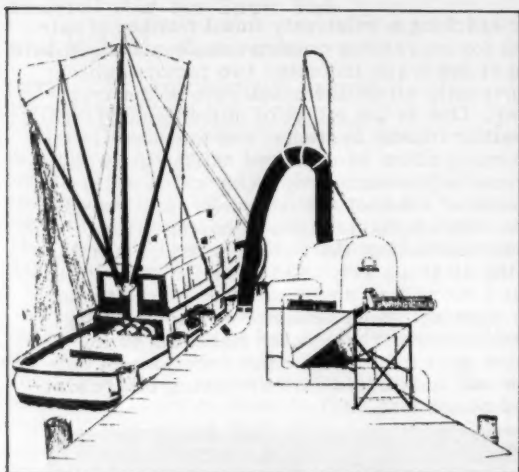
The tests were conducted as part of a gear-development project to assist the farm-pond fish operators to economically harvest fish raised for the commercial market.



Fish Handling

AIR PUMP FOR UNLOADING FISH:

An air pump to unload fishing vessels is offered by a Texas company. The pump is available in varying capacities to fit different operations. The manufacturer states, "Basically, this new unit operates on a vacuum dry-air suction principle, utilizing a lightweight rubber suction hose that is lowered into the hold of the trawler, through which the product is air-lifted into a vacuum chamber and discharged into a standard-type wash tank equipped with a conveyor belt to remove the product from the tank. No water is required in the hold of the trawler." The manufacturer claims: (1) this method of unloading requires only one man to lower the hose into a vessel and to do such raking as is necessary



to keep a steady flow of product being air-lifted into the tank; (2) the unit does not damage fish or shellfish in any manner and actually eliminates the damage normally done through shoveling as when unloading by basket or barrel methods; and (3) capacity per hour has proven very satisfactory with a low maintenance cost.



Fish Kills

FISH KILLS BY WATER POLLUTION IN 1963:

Water pollution killed more than an estimated 7.8 million fish during 1963, reported the U. S. Public Health Service on June 5, 1964. This is an increase of 750,000 fish over the estimated water-pollution fish kill reported in 1962. Industrial operations, the largest identified cause of fish kills, accounted for almost 3.2 million dead fish. Municipal sewage, the second most common cause, killed more than 1 million fish, and agricultural operations caused more than 760,000 fish deaths.

The U. S. Public Health Service does not specify the number of fish that died in the 1963 heavy fish kill on the lower Mississippi River in Louisiana. At the time the State of Louisiana reported the kill it was not known whether the deaths were natural or caused by pollution. The cause of the fish kill has since been found to be endrin (a pesticide).

Eight states did not submit reports on fish kills. Three states reported no known kills occurring in their areas.

In addition to the massive fish kills in Louisiana, three other large fish kills were reported in 1963. An estimated 2 million fish were killed in the Wahiawa Reservoir on Oahu Island in Hawaii. The fish were reported dying in a limited area of the reservoir in the vicinity of the Wahiawa sewage treatment plant. Although the plant gives complete treatment to its sewage, there is a possibility that some toxic substance may have been discharged, but it was not proved.

An accidental spill of lethal quantities of resin acid soaps from a paper company near Weldon, N. C., killed about 100,000 fish. The spill lasted for 8 minutes and dumped between 10,000 and 15,000 gallons of the wastes, affecting more than 100 miles of the Roanoke River.

The third large fish kill in 1963 occurred in the Coweeman River near Kelso, Wash., where an accidental break in a hose dumped 4,000 gallons of Diesel oil into the river. Fish were completely destroyed or severely damaged along a 10- to 13-mile stretch of the river and an estimated total of 59,000 fish were killed.

More than 2,200 miles of river and more than 5,600 acres of lakes were involved in the fish kills reported for 1963.

Note: See Commercial Fisheries Review, July 1963 p. 50.



Fur Seals

MODIFIED TAGGING TECHNIQUES SUGGESTED TO PREVENT EXCESS MORTALITY:

The possible reason why the mortality rate of tagged fur seal pups is higher than that of untagged pups has been indicated by dissection studies by the U. S. Bureau of Commercial Fisheries Marine Mammal Laboratory in Seattle, Wash. Special attention to the arm and flipper revealed that vital blood vessels and "swimming" muscles make up the site where tags for population studies are normally attached. In view of that finding, research biologists tagging or marking other animals may wish to examine their marking and tagging techniques.



Gear

MIDWATER TRAWL TESTS SUCCESSFUL IN PACIFIC COAST HAKE FISHERY:

The first successful use of an experimental midwater trawl to capture large quantities of hake may be a major breakthrough in the establishment of a new commercial fishery off the Pacific Coast of the United States, Secretary of the Interior Stewart L. Udall announced on May 29, 1964. The use of such gear to catch hake (a species related to East Coast whiting) indicates the feasibility of commercial harvesting of this abundant but presently unused West Coast resource, the Interior Secretary added.

The trawl (a net with an 80-foot by 80-foot oval opening which fishes in the mid-depths of the ocean) was developed by fishing gear specialists of Interior's Bureau of Commercial Fisheries Regional Office at Seattle, Wash. It is many times larger than nets commonly used by United States commercial fishermen.

A significant factor in recent tests of the new trawl was that it was used on a standard commercial trawler, the *St. Michael*, a 75-foot vessel operating out of Bellingham, Wash., indicating the adaptability of the present West Coast fishing fleet to this type gear. The *St. Michael*, chartered by the Bureau of Commercial Fisheries, made four one-hour drags during the test in depths of from 50 to 60 fathoms (300 to 360 feet). The catch amounted to 8,200 pounds on the first trawl, 30,000 pounds the second, 42,000 the third, and 60,000 the fourth. The fish were located by an echo-sounder southwest of Destruction Island off the north coast of Washington. They averaged about 22 inches long and weighed from 2 to 3 pounds each.

Scientific studies have shown that hake is the most prolific fish along the Pacific Coast, Secretary Udall said. Hake can be used as a food fish, makes a high quality white fish meal for animal and poultry feeds, and has great potential for use in the manufacture of fish protein concentrate.



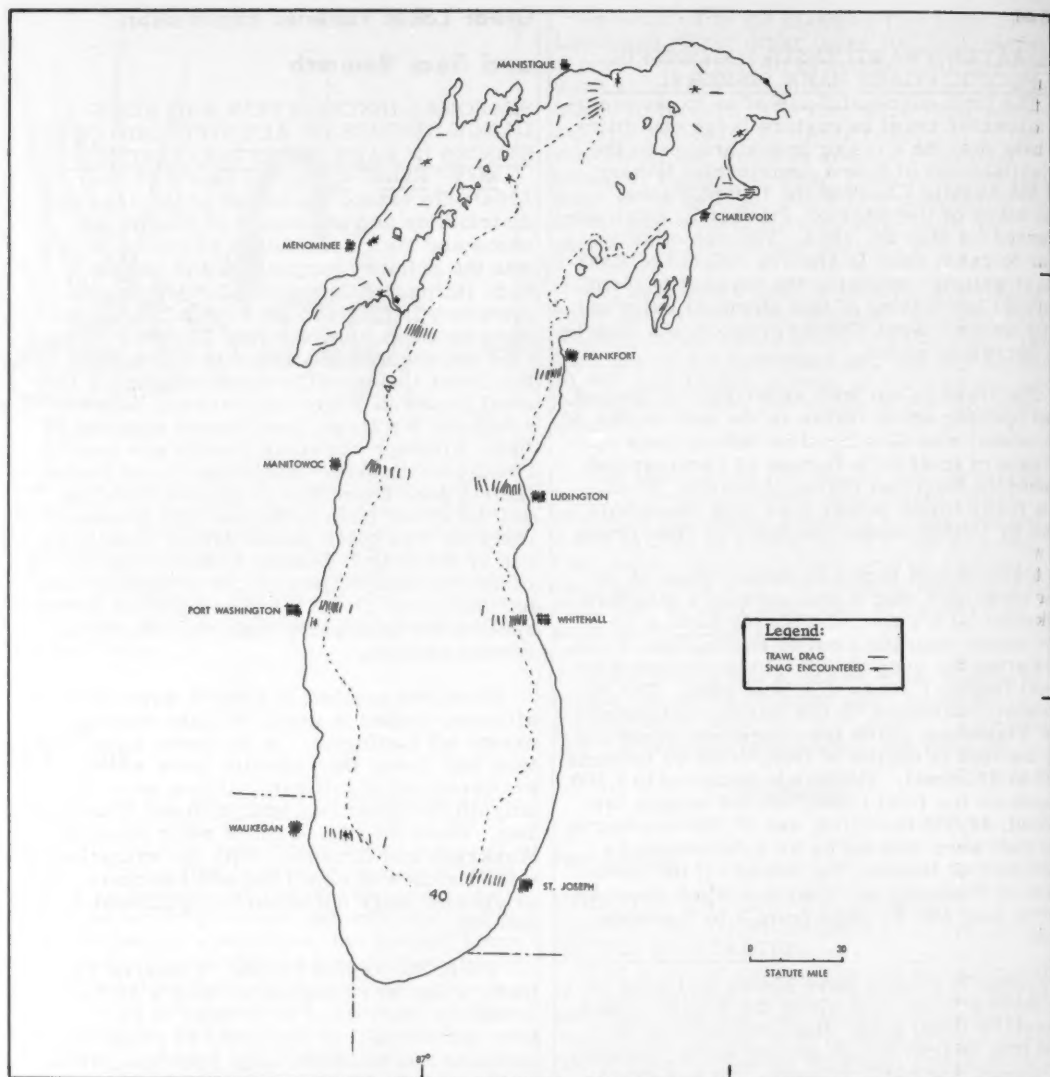
Great Lakes Fisheries Exploration and Gear Research

SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE AND CHUB STOCKS IN LAKE MICHIGAN CONTINUED:

M/V "Kaho" Cruise 17 (April 28-May 22, 1964): To extend knowledge of the seasonal distribution and abundance of alewife and chubs and their availability to bottom trawls was the primary purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel *Kaho* between April 28-May 22, 1964--a period not previously studied in this portion of the Great Lakes. (The establishment of fish meal plants in Wisconsin recently has created a demand for large, inexpensive supplies of fish. Although spawning alewife are usually readily available to traditional Great Lakes fishing gear from May to August, trawling will be relied upon to furnish fish economically for fish meal plants during other periods of the year.) Secondary objectives of the cruise were to collect length-frequency data for chubs and alewife, and samples of various species for laboratory analysis relating to special studies.

Excellent catches of alewife were taken in all areas fished in southern Lake Michigan except off Ludington. In northern Lake Michigan and Green Bay, alewife were widely scattered and significant catches were made only off Sturgeon Bay and in Grand Traverse Bay. Good catches of chubs were taken off Waukegan and Arcadia. With the exception of a few catches of smelt and white suckers, other species were not taken in significant amounts.

FISHING OPERATIONS: A total of 135 trawl drags were completed with a 52-foot (headrope) fish trawl in 20 days of exploratory operations. Of the total, 66 drags were completed in southern Lake Michigan, 46 in northern Lake Michigan, and 23 in Green Bay. At each fishing location in the open lake, paired drags were made in opposite directions at a preselected depth to determine the optimum towing direction for making all other drags in the area. Drags were of 30 minutes duration except for 14 which were terminated



Lake Michigan explorations, M/V *Kaho* Cruise 17 (April 28-May 22, 1964).

early due to the presence of rough bottom or set nets and 4 others which were terminated after 15 minutes because of the large quantities of alewife being taken.

Although snags were encountered, net damage was relatively minor. Bottom topography and bathymetric distribution of fish were continuously monitored and recorded with a high-resolution echo sounder.

FISHING RESULTS: Southern Lake Michigan: Fishing results at stations off opposite shores in the southern portion of the Lake revealed substantial differences in species interrelationship and availability. Excellent catches of alewife were taken at various depths in each area except off Ludington, where catches of all species were insignificant, possibly due to severe weather conditions immediately preceding the exploratory

fishing effort. The best catch rate for alewife was experienced off Port Washington at 10 fathoms, where 1,500 pounds of alewife were caught in a 5-minute drag. At other fishing stations in southern Lake Michigan, the best catches of alewife ranged from 1,340 to 3,800 pounds per drag.

Good catches of chubs (ranging from 300 to 1,130 pounds) were taken at 40 fathoms off Benton Harbor, at 25 to 45 fathoms off Waukegan, at 25 and 35 fathoms off Port Washington, and at 35 and 40 fathoms off Manitowoc. Sculpins were taken in moderate amounts at the relatively deeper depths.

Northern Lake Michigan: Significant catches of alewife in northern Lake Michigan were made off Sturgeon Bay at 15, 20, and 25 fathoms (450 to 650 pounds) and in Grand Traverse Bay at 25 and 35 fathoms (525 and 450 pounds). The best catches of chubs (230 to 600 pounds) were taken at 20 to 45 fathoms off Arcadia, Michigan. A fairly large catch of white suckers (325 pounds) was taken in Little Traverse Bay. Sculpins and smelt also were caught in moderate amounts in northern Lake Michigan.

Green Bay: Operations in Green Bay produced only small catches of alewife. Individual catches of smelt (250 pounds) and white suckers (120 and 195 pounds) were the only species caught in significant amounts throughout Green Bay.

Echo-sounder recordings near the entrance to Green Bay indicated scattered fish at mid-depths--apparently the vanguard of the migration of alewife into Green Bay.

HYDROGRAPHIC DATA: Bathythermograph casts were made in each fishing area, and air and water temperatures were recorded continuously. During the cruise, the surface water temperatures of Lake Michigan ranged from 34° to 48° F. and those of Green Bay from 36° to 58° F.

M/V "Kaho" Cruise 19 (June 23-July 23, 1964): To extend knowledge of the seasonal distribution, abundance, and availability of alewife and chub stocks to bottom trawls was the primary objective of this cruise by the Bureau's exploratory fishing vessel *Kaho*. The announcement of this cruise was made June 18, 1964. Following trawl explorations in Green Bay and northern Lake Michigan from June 23 to July 2, the vessel berthed at

its base in Saugatuck, Mich., for about ten days and then resumed trawl explorations in southern Lake Michigan.

Area of Operation: Lakewide transects were planned in Lake Michigan between Benton Harbor, Mich., and Waukegan, Ill.; Port Washington, Wis., and White Lake Mich.; Manitowoc, Wis., and Ludington, Mich.; and Frankfort, Mich., and Sturgeon Bay, Wis. Previously established fishing stations in Green Bay and northern Lake Michigan near Manistique, north of Beaver Island, and in Little and Grand Traverse Bays.

Method of Operation: High-resolution echosounding equipment was to be used to record bottom and off-bottom fish concentrations. A 52-foot (headrope) fish trawl was to be used at standard stations to assess the commercial trawling potential. Thirty-minute tows were to be made at 5-fathom intervals from 10 to 50 fathoms and at 10-fathom intervals from 50 to 70 fathoms along the lakewide transects. Various hydrographic and meteorologic conditions were to be monitored continuously, and night-light stations occupied in southern Lake Michigan to determine the effectiveness of attracting lights.

Note: See Commercial Fisheries Review, June 1964 p. 15.

MORE EFFECTIVE TRAWLING OF COMMERCIAL SPECIES IN LAKE SUPERIOR STUDIED:

M/V "Kaho" Cruise 18 (May 25-June 10, 1964): To determine the potential for more effective and profitable methods of catching and handling commercial fish species in Lake Superior was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Kaho*. The area of operations was in Lake Superior between Munising and the Keweenaw Peninsula.

This 17-day cruise was the first of three planned for this year. Fishery explorations by the *Kaho* are part of a special program to furnish technical assistance to the fishing industry in the Great Lakes region. Other aspects of the program include studies on the development, preservation, and marketing of fishery products, and economic analyses of existing and potential industry operations.

Principal accomplishments resulting from this cruise included: (1) the location of considerable areas suitable for bottom trawling,

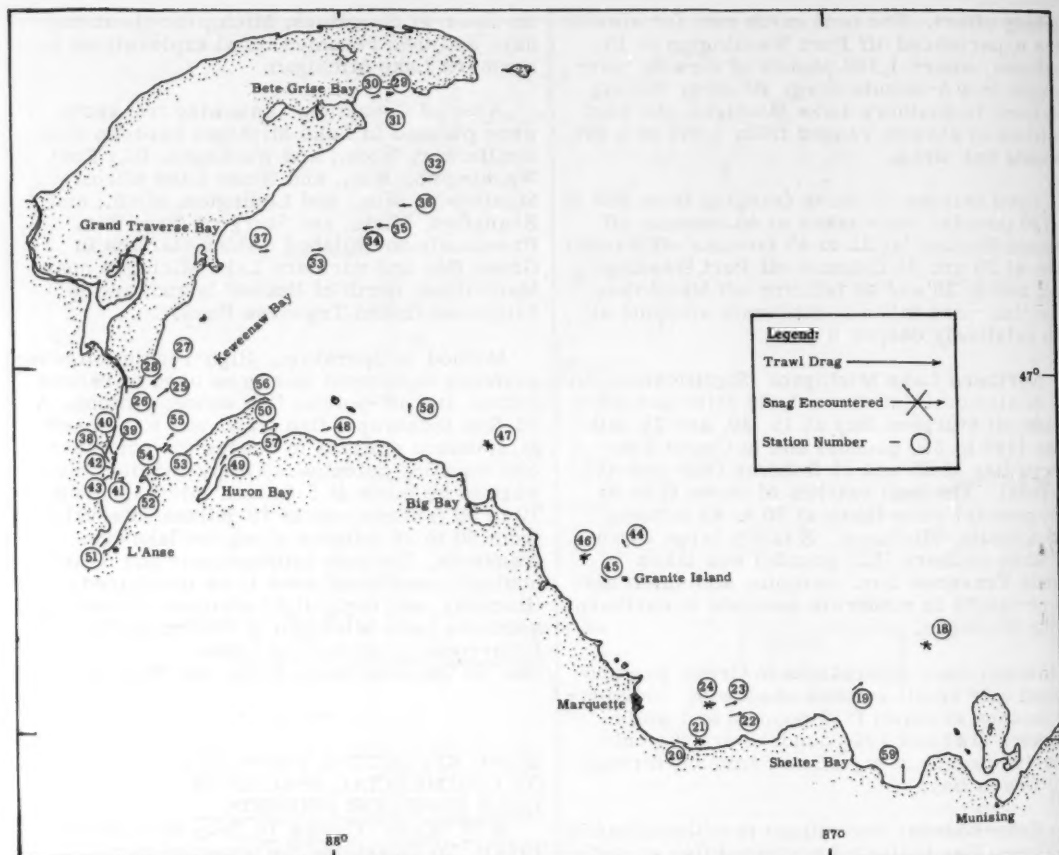


Fig. 1 - Shows area of operation during Kaho Cruise 18, May 25-June 10, 1964.

(2) the catching of commercially significant quantities of chub and smelt, and (3) the incidental detection and recording of midwater concentrations of fish. Although it was necessary to search intensively for good trawling grounds in that area, which is noted for steep and rugged bottom conditions, clear areas were found at various depths ranging from 5 to 62 fathoms. Good catches of chub were taken in Keweenaw Bay and off the eastern shore of Keweenaw Peninsula, and fair amounts of smelt were caught in Keweenaw Bay and Huron Bay. Only small catches of cisco (lake herring) were made during the cruise, but the many small scattered schools of fish detected in middepths could well have been composed of that species. Midwater and surface fishing are to be attempted during the next two cruises scheduled for August and November.

Exploratory Operations: Survey transects, totaling about 800 statute miles, were carefully examined with a high-resolution white-line-type echo-sounder and a standard deep-water sounder. The former instrument detects subsurface fish, discriminates fish echos from bottom echos when the two are in close proximity, and provides evidence of bottom characteristics (figure 2).

A total of 42 drags was made with a 52-foot (headrope) Gulf of Mexico-type fish trawl where bottom conditions appeared to be suitable (see table 1). Dragging time was held to 15 minutes during most of the operation because of unfamiliarity with bottom conditions and to permit broader coverage within the limited time period. Snags, logs and trees, or rough bottom conditions were encountered during 13 drags--most of which were terminated when

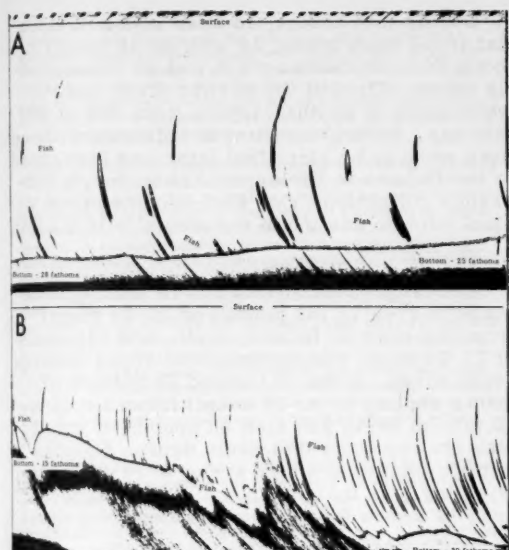


Fig. 2 - Echograms from a high resolution echo-sounder showing bottom profile, fish near the bottom, and at midwater depths. A--Echogram made at station 50; distance traveled is 2 nautical miles. B--Echogram made near station 53; distance traveled is approximately 4 nautical miles.

difficulties were recognized. Only 3 of the encounters resulted in severe net damage. Four others suffered minor damage and the remaining 6 caused no damage.

The actual fishing effort during the cruise was limited due to the time required for searching out trawlable grounds. Activities from Munising to Big Bay were restricted because of numerous commercial gill-netting operations. Although soundings were made to depths of over 100 fathoms, fishing was confined for the most part to depths of less than 50 fathoms (see table 1).

Fishing Results: The best fishing results of the cruise were in Huron Bay, Keweenaw Bay, and off the east shore of Keweenaw Peninsula. Chub were caught in amounts of from 110 to 415 pounds in seven 15-minute drags, and smelt in amounts up to 300 and 320 pounds in two 30-minute drags. Smelt were found to be distributed over a relatively wide depth range of from 5 to 39 fathoms. Catches of that species consisted of many sizes ranging from small 3- to 4-inch juveniles to the older fish measuring 12 inches long or over. Relatively large chubs were caught in commercially significant quantities at depths ranging from 35 to 62 fathoms--the deepest water

Table 1. Fishing Log Miscellaneous during M/V Kahlo Cruise 18 in Lake Superior											
Date	Depth in Fathoms	Length of Day in Minutes	Actual Catch in Pounds								
			Total	Alewife	Chub	Smelt	Whitefish	Cisco	Lake trout	Other	
No Requested by Captain to Sample	58 7-14	30	12	1	-	10	1	-	-	-	
	18 17-25	2/30	3	-	-	-	-	-	1	1	
	19 18-31	2/25	0	-	-	-	-	-	-	-	
	30 8	30	50	-	-	1	41	-	-	8	
	31 8-11	5/30	8	1	-	1	2	-	-	3	
No Requested by Captain to Sample	32 18-20	30	8	-	-	4	1	-	1	3	
	33 23-25	1/24	8	1	-	1	-	-	-	4	
	45 34	30	31	30	-	1	-	-	-	1	
	24 29-31	1/30	8	1	-	4	-	-	3	-	
	48 30	3/7	33	-	-	-	-	23	1	-	
No Requested by Captain to Sample	44 42	5/10	18	1	18	-	-	-	-	3	
	48 12	5/13	1	-	-	1	-	-	-	-	
	49 13	15	80	25	-	35	8	1	1	3	
	47 30	1/5	1	-	-	-	-	1	-	-	
	57 22-24	30	325	18	2	300	15	-	3	1	
No Requested by Captain to Sample	58 22-25	15	2	2	-	-	-	-	-	-	
	50 38	30	350	12	6	320	6	-	3	2	
	38 5-8	15	7	-	-	1	-	-	4	3	
	42 8-8	30	100	7	-	25	9	2	30	7	
	38 7-8	15	110	-	-	90	5	-	11	4	
No Requested by Captain to Sample	45 7-10	15	10	-	-	2	1	-	7	-	
	40 10-11	15	4	-	-	2	-	-	2	-	
	51 10-15	15	8	-	-	2	1	-	3	-	
	41 14-15	15	80	-	-	47	1	-	1	1	
	42 18-23	15	25	-	-	10	-	-	1	1	
	58 30	5/15	4	1	-	3	-	-	2	1	
	27 31-35	30	30	-	4	35	-	-	1	-	
	38 28-30	5/30	80	4	25	42	-	-	8	3	
	37 28-30	30	125	2	60	45	-	-	12	2	
	53 35	15	145	-	125	1	-	-	13	2	
	35 36-39	5/30	75	3	45	21	-	-	2	3	
	54 41	15	120	-	113	-	-	-	8	2	
No Requested by Captain to Sample	55 50	1/10	43	-	40	-	-	-	1	1	
	38 5	2/4	0	-	-	1	2	-	-	-	
	30 10	15	8	-	-	-	-	-	-	-	
	31 13-15	15	60	-	-	85	-	-	4	1	
	32 28-29	15	25	-	44	-	1	2	1	8	
	37 28-30	15	445	1	415	-	-	8	19	2	
	39 44-47	15	230	-	230	-	-	0	1	1	
	34 48-51	15	175	-	170	-	-	-	-	5	
	38 54-56	15	175	-	160	-	-	-	4	11	
	33 57-62	15	130	-	110	-	-	1	-	1/20	
	* Mostly near gill net.										
	* Encountered small net, dog terminated early.										
* Toss in net, slight damage.											
* Encountered rough bottom, no damage.											
* Toss in net, no damage.											
* Shrug up, no damage.											
* Minor abrasions.											

/Mostly round whitefish.
/Gillnet, tow net.
/Encountered gill net, drag terminated early.
/Log in net, slight damage.
/Encountered rough bottom, no damage.
/Log in net, no damage.
/Drag up, no damage.
/Muddy sculpin.

fished during the cruise. The measurement of samples indicated that 70 percent (by weight) of the chub catches were comprised of fish over nine inches long (No. 2's, No. 1's, and "jumbos").

Only small numbers of cisco were taken occasionally throughout the depth ranges fished. Midwater groups of fish, which may have been cisco recorded by the depth-sounder, were judged to be too small and too scattered to warrant attempts to fish for them during this cruise.

Alewife, whitefish, and lake trout were also caught in relatively small amounts. Individual alewife were large in comparison to those caught in Lake Michigan during recent years. Round whitefish were taken more often than were common whitefish.

Species	No. of Drags Yielding	Catch Per Drag
Burbot	10	up to 12 pounds
Pigmy whitefish	11	up to 3 pounds
Sculpin	8	up to 27 pounds
Stickleback	14	up to 4 pounds
Suckers	3	up to 2 pounds
Trout-perch	6	up to 1 pound

Water Temperatures: A bathythermograph and continuous surface temperature recorder were used to monitor thermal gradients in the areas fished. Stratification was not well defined, but surface temperatures varied from 40° F. to 52° F. from offshore to sheltered waters and bottom temperatures ranged from 39° F. to 48° F. in the same manner.

Technological Studies: Observations were made and fish samples collected to initiate technological preservation and processing investigations in connection with the Lake Superior technical assistance program.



Great Lakes Fishery Investigations

SEA LAMPREY CONTROL IN LAKE SUPERIOR AND LAKE MICHIGAN:

The number of spawning-migrant sea lampreys captured at the electric barriers on streams tributary to Lake Superior totaled 8,816 as of June 12, 1964, compared with 6,736 and 6,138 for the same period in 1963 and 1962, respectively. Reports indicated that conditions were favorable for an early sea lamprey run during the 1964 season which may explain the larger number of lampreys captured. The June 1964 catch was still well below that of 1961 when 42,395 adults were taken through the same period. The three barriers on streams entering northern Green Bay of Lake Michigan caught only 4,319 adult sea lampreys through June 12, 1964, compared with 6,995 for the same period in 1963.

Note: See Commercial Fisheries Review, October 1963 p. 23, July 1963 p. 38.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-17 (May 12-26, 1964): Shrimp distribution studies in the northwestern part of the Gulf of Mexico (off the Mississippi to Texas coasts) were continued during this cruise by the chartered research vessel *Gus III* of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made.

During this cruise, 43 tows with a 45-foot flat trawl were made, as well as 46 plankton tows, 60 bathythermograph and 43 nansen bottle casts. Eight of the shrimp trawl tows were made in depths varying from 200 to 480 fathoms. Shrimp specimens collected in those tows were to be identified later and then added to the Galveston Biological Laboratory's reference collection. One sled-mounted Gulf V plankton tow was made successfully in a depth of 520 fathoms.

The largest catches of brown shrimp were made in area 16 (41 pounds of 15-20 count) from the over 20 fathom depth, and 11 pounds of 21-25 count shrimp from the 10-20 fathoms depth range. Area 20 yielded 33 pounds of brown shrimp (over 68 count) from the up to 10 fathom depth and also 46 pounds of small pink shrimp from that same depth. Catches of pink shrimp in other areas were sporadic (yielding less than one pound each) except in area 19 where 5 pounds was taken from the 0-10 fathom depth.

Catches of white shrimp were moderate in area 13 (30 pounds of mostly 21-25 count) with the 10-20 fathom depth yielding the greater part. White shrimp were also caught in the 0-10 fathom depth of area 19 (20 pounds of 15-20 count), as well as 6 pounds of the same count from 10-20 fathoms in that area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, July 1964 p. 14.



Industrial Fishery Products

OBSERVATIONS AND VIEWS IN TEXAS ON USE OF FISHERY BYPRODUCTS IN ANIMAL FEED:

Mixed feed manufacturers and experiment station workers in Texas were visited during April 27-May 5, 1964, by the Animal Nutritionist of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit, Boston, Mass. Observations made during that trip and the views of persons interviewed follow:

Whereas nearly all the feed mill officials and experiment station scientists visited on the trip expressed high regard for fish reduction products in nutrition, many offered comments that, taken together, suggest that the future market for those products may tend to decrease unless some changes are made.

The comment most frequently heard was that at the prices prevailing in April and May 1964, fish meal is in danger of being "priced off the market." For example, a nutritionist employed by a large firm stated that fish meal is not included in his rations, formulated by linear programming, unless minimum levels are specified. Broiler and poultry breeder

rations produced by that firm do contain 3-percent fish meal, but this is only because of the minimum that is specified, whereas turkey starter rations are supplied with more liberal levels as "safety factors." Another nutritionist employed by a large firm said that less than 1 percent of fish meal is incorporated in his rations by computer formulation, but he includes 3 percent of the meal in his turkey and broiler starter rations "just to be on the safe side."

The comment encountered with second greatest frequency is that the mixed feed industry cannot much longer tolerate the extreme variability in quality exhibited by some imported fish meals and, in addition, according to a number of mixed feed producers, domestic fish meals are not invariably of top quality. A leading experiment station scientist pointed out that the amounts of feed mixed by present-day methods according to a single formula are extremely large and, for that reason, mistakes of any kind in feed mixing cannot be tolerated. If ingredients (including fish meal) below the quality specified in the formula are included in the mixture, the end result might be a ration that would not perform properly in actual use. The scientist suggested that if fish meal of uniform high quality cannot be marketed, the second best solution may be to sell three different grades of meal. Several nutritionists employed by feed mills stated that there is little hope that a grading system can be made to function effectively.

An official of a very large Texas firm stated that for the past 6 years his company has been using only imported pilchard meal because of its consistently high quality and also because it is slightly less expensive at the company's mill than is United States whole meal. (Whole meal is preferred to ordinary fish meal by the officials of this particular firm.) During a period of several years, only one shipment of inferior pilchard meal was received and a satisfactory adjustment was made on that shipment without delay.

A nutritionist representing a very large feed-producing firm dramatized the prevailing situation with regard to variability in fish meal quality by exhibiting some samples under magnification. Concerning a sample that contained excessive amounts of salt, scales, and bone, he said: "The sale of this sort of product is going to ruin the market for fish meal unless buyers are informed in advance of the quality of the products they are getting."

A number of nutritionists stated that since the introduction on the market of a uniform high quality poultry byproducts meal, feed producers are no longer dependent entirely upon fish meal. It was also pointed out by a number of nutritionists that the quality of feather meal produced by some firms is quite high and that such meal is competitive with fish meal as a source of some amino acids and B vitamins.

Workers also pointed out that the two commonly used methods of measuring the fat in fish meal yield very different results. The two methods are the ether extract procedure and the method of the A.O.A.C. (Association of Official Agricultural Chemists). This problem should receive early attention; the statement that a given sample of fish meal contains a definite amount of fat should not leave the buyer in doubt as to the actual amount of this nutrient present.

Several producers of cattle feeds expressed interest in fish meal as an ingredient of "range blocks." Such blocks, consisting of a mixture of protein, mineral, and vitamins, often contain fish meal. Cattle feed producers also expressed interest in the possibility of using marine oils in their products when, and if, the prices of such oils should decline low enough to make them competitive with stabilized fats.

A leading Texas research scientist suggested experiments to determine the feasibility of using marine oils in the nutrition of young turkeys. He suggests that the oils might be used at levels as high as 5 percent of the ration to stimulate growth for 8 to 16 weeks, then reduced to 1 percent, or less, to avoid the possibility of off-flavors in the meat. Because of the large number of turkeys grown in the United States, such fowl offer a possible market that may be large enough to absorb any overproduction of marine oils that may take place in the future. At present prices, fish oil is

too valuable to be used as a source of energy. However, if at some future time the price of the oil should decline enough to make it competitive with stabilized fats, its use in turkey feeding can be given consideration. (Technical Advisory Unit, U. S. Bureau of Commercial Fisheries, Boston, Mass.)

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-April 1964: Based on domestic production and imports, the United States available supply of fish meal for January-April 1964 amounted to 175,429 short tons--26,059 tons (or 17.4 percent) more than during January-April 1963. Domestic production was 3,229 tons (or 19.8 percent) less, but imports were 29,288 tons (or 22.0 percent) higher than in January-April 1963. Peru continued to lead other countries with shipments of 130,276 tons.

The United States supply of fish solubles (including homogenized fish) during January-April 1964 amounted to 7,377 tons--a decrease of 28.0 percent as compared with the same period in 1963. Domestic production and imports dropped 31.8 percent and 6.3 percent, respectively.

U. S. Supply of Fish Meal and Solubles, January-April 1964 with Comparisons			
Item	Jan.-Apr.		Total 1963
	1/1964	1963	
	..... (Short Tons).....		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	3,146	4,991	181,750
Tuna and mackerel	5,207	7,167	26,957
Herring	2/	-	7,537
Other	4,705	4,129	37,208
Total production	13,058	16,287	253,452
Imports:			
Canada	19,300	13,603	50,925
Peru	130,276	104,219	291,544
Chile	7,396	12,220	24,249
Norway	-	331	1,819
So. Africa Republic	4,578	1,950	12,296
Other countries	821	760	2,274
Total imports	162,371	133,083	383,107
Available fish meal supply	175,429	149,370	636,559
Fish Solubles:			
Domestic production 2/	5,838	8,562	107,402
Imports:			
Canada	737	781	2,034
Iceland	-	105	160
So. Africa Republic	604	-	411
Other countries	198	792	4,168
Total imports	1,539	1,678	6,773
Available fish solubles supply	7,377	10,240	114,175
1/ Preliminary. 2/ Included with "other." 3/ 50-percent solids. Includes production of homogenized condensed fish.			

1/ Preliminary.

2/ Included with "other."

3/ 50-percent solids. Includes production of homogenized condensed fish.

* * * * *

Production and Imports, January-March 1964: Based on domestic production and imports, the United States available supply of fish meal for January-March 1964 amounted to 112,205 short tons--2,218 tons (or 1.9 percent) less than during January-March 1963. Domestic production was 2,160 tons (or 27.2

U. S. Supply of Fish Meal and Solubles, January-March 1964 with Comparisons			
Item	Jan.-Mar.		Total 1963
	1/1964	1963	
..... (Short Tons)			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	2/	-	181,750
Tuna and mackerel	3,445	5,739	26,957
Herring	2/	2/	7,537
Other	2,342	2,208	37,208
Total production	5,787	7,947	253,452
Imports:			
Canada	13,329	9,454	50,925
Peru	84,392	87,751	291,544
Chile	4,379	6,835	24,249
Norway	-	331	1,819
So. Africa Republic	3,578	1,450	12,296
Other countries	740	655	2,274
Total imports	106,418	106,476	383,107
Available fish meal supply . .	112,205	114,423	636,559
Fish Solubles:			
Domestic production 2/ . . .	2,793	5,361	107,402
Imports:			
Canada	455	563	2,034
Iceland	-	105	160
So. Africa Republic	429	-	411
Other countries	198	729	4,168
Total imports	1,082	1,460	6,773
Available fish solubles supply.	3,875	6,821	114,175
1/ Preliminary.			
2/ Included with "other."			
3/ 50-percent solids. Includes production of homogenized condensed fish.			

percent) less, and imports were only 58 tons less than in January-March 1963. Peru continued to lead other countries with shipments of 84,392 tons.

The United States supply of fish solubles (including homogenized fish) during January-March 1964 amounted to 3,875 tons--a decrease of 43.2 percent as compared with the same period in 1963. Domestic production and imports dropped 47.9 percent and 25.9 percent, respectively.

Production and Imports, January-February 1964: Based on domestic production and imports, the United States available supply of fish meal for January-February 1964 amounted to 70,013 short tons--6,300 tons (or 9.9 percent) more than during January-February 1963. Domestic production was 1,403 tons (or 27.3 percent) less, but imports were 7,703 tons (or 13.1 percent) more than in January-February 1963. Peru continued to lead other countries with shipments of 55,222 tons.

The United States supply of fish solubles (including homogenized fish) during January-

U. S. Supply of Fish Meal and Solubles, January-February 1964 with Comparisons			
Item	Jan.-Feb.		Total 1963
	1/ 1964	1963	
. . . (Short Tons) . . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	2/	-	181,750
Tuna and mackerel	2,022	3,930	26,957
Herring	2/	2/	7,537
Other	1,707	1,202	37,208
Total production	3,729	5,132	253,452
Imports:			
Canada	7,803	5,794	50,925
Peru	55,222	46,631	291,544
Chile	1,051	3,800	24,249
Norway	-	331	1,819
So. Africa Republic	1,678	1,450	12,296
Other countries	530	575	2,274
Total imports	66,284	58,581	383,107
Available fish meal supply . .	70,013	63,713	636,559
Fish Solubles:			
Domestic production 2/ . .	1,882	2,645	107,402
Imports:			
Canada	345	212	2,034
Iceland	-	105	160
So. Africa Republic	339	-	411
Other countries	198	-	4,168
Total imports	882	317	6,773
Available fish solubles supply.	2,764	2,962	114,175
1/ Preliminary.			
2/ Included with "other."			
3/ 50-percent solids. Includes production of homogenized condensed fish.			

February 1964 amounted to 2,764 tons--a decrease of 6.7 percent as compared with the same period in 1963. Domestic production dropped 28.8 percent and imports increased 178.2 percent.

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, April 1964: During April 1964, a total of about 3.5 million pounds of marine-animal oils and 7,094 tons of fish meal and scrap was produced in the United States. Compared with April 1963, this was a decrease of 3.1 million pounds or 47.0 percent in oil, and a decrease of 1,246 tons or 14.9 percent in meal and scrap production.

Menhaden oil, amounting to 2.7 million pounds, accounted for 77.9 percent of the April 1964 oil production. Compared with April 1963, this was a decrease of 3.0 million pounds. Menhaden meal, amounting to 3,146 tons, accounted for 44.3 percent of the April meal production--a decrease of 1,845 tons, compared with the same month last year.

A total of 3,045 tons of fish solubles was produced in April 1964--a decrease of 1,042

U. S. Production of Fish Meal, Oil, and Solubles, April 1964 1/ with Comparisons					
Product	April		Jan.-Apr.		Total 1963
	1/1964	1963	1/1964	1963	
..... (Short Tons)					
Fish Meal and Scrap:					
Herring	2/	-	2/	-	7,537
Menhaden 3/	3,146	4,991	3,146	4,991	181,750
Sardine, Pacific	-	-	1	-	-
Tuna and mackerel	1,762	1,428	5,207	7,167	26,957
Unclassified	2,186	1,021	4,704	4,129	22,415
Total	7,094	8,340	13,058	16,287	238,659
Shellfish, marine-animal meal and scrap					
	4/	4/	4/	4/	14,793
Grand total meal and scrap					
	4/	4/	4/	4/	253,452
Fish Solubles:					
Menhaden	1,265	1,836	1,325	1,836	74,831
Other	1,780	2,251	4,513	5,476	25,347
Total	3,045	4,087	5,838	7,312	100,178
Homogenized condensed fish					
	-	950	-	1,250	7,224
..... (1,000 Pounds)					
Oil, Body:					
Herring	-	2/	-	46	5,709
Menhaden 3/	2,703	5,700	2,767	5,700	167,635
Tuna and mackerel	336	301	1,112	1,170	5,735
Other (including whale)	433	550	1,122	937	6,748
Total oil	3,472	6,551	5,001	7,853	185,827

1/ Preliminary data.
2/ Included in "other" or "unclassified."
3/ Includes a small quantity of thread herring.
4/ Not available on a monthly basis.

1/ Preliminary data.

2/ Included in "other" or "unclassified."

3/ Includes a small quantity of thread herring.

4/ Not available on a monthly basis.

U. S. Production of Fish Meal, Oil, and Solubles, March 1964 1/ with Comparisons					
Product	March		Jan.-Mar.		Total 1963
	1/1964	1963	1/1964	1963	
..... (Short Tons)					
Fish Meal and Scrap:					
Herring	-	-	2/	2/	7,537
Menhaden 3/	-	-	2/	-	181,750
Sardine, Pacific	-	-	1	-	-
Tuna and mackerel	1,423	1,809	3,445	5,739	26,957
Unclassified	812	906	2,341	2,208	22,415
Total	2,235	2,715	5,787	7,947	238,659
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	14,793
Grand total meal and scrap	4/	4/	4/	4/	253,452
Fish Solubles:					
Menhaden	-	-	2/	-	74,831
Other	911	1,984	2,793	5,061	25,347
Total	911	1,984	2,793	5,061	100,178
Homogenized condensed fish	-	250	-	300	7,224
..... (1,000 Pounds)					
Oil, Body:					
Herring	2/	-	2/	2/	5,709
Menhaden 3/	-	2/	-	-	167,635
Tuna and mackerel	199	334	776	869	5,735
Other (including whale)	385	118	689	432	6,748
Total oil	584	452	1,465	1,301	185,827

1/ Preliminary data.

2/ Included with unclassified.

3/ Includes a small quantity of thread herring.

4/ Not available on a monthly basis.

1/ Preliminary data.

2/ Included with unclassified.

3/ Includes a small quantity of thread herring.

4/ Not available on a monthly basis.

tons or 25.5 percent as compared with April 1963.

The quantity of fish meal processed during the first 4 months of 1964 amounted to 13,058 tons--3,229 tons less than the same period of the previous year. Marine-animal oil amounted to 5.0 million pounds--2,852 pounds less than the same period of 1963.

Production, March 1964: During March 1964, a total of 2,235 tons of fish meal and scrap and 584,000 pounds of marine animal oil was produced in the United States. Compared with March 1963 this was a decrease of 480 tons (17.7 percent) in fish meal production but an increase of 132,000 pounds (29.2 percent) in fish oil production.

The quantity of fish solubles manufactured in March 1964 amounted to 911 tons--1,073 tons less than in March 1963.

Production of tuna and mackerel meal amounted to 1,423 tons which accounted for about 63.7 percent of the March production. Oil from tuna and mackerel (199,000 pounds)

comprised 34.1 percent of the March fish oil production.

Major Indicators for U. S. Supply, March 1964: United States production of fish meal in March 1964 was lower by 17.7 percent as compared with March 1963. Production of fish solubles was down by 59.2 percent, but production of fish oil increased 29.2 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, March 1964					
Item and Period	1/1964	1963	1962	1961	1960
..... (Short Tons)					
Fish Meal:					
Production:					
March	2,235	2,715	4,245	2,751	3,064
January-February	2,379	5,232	6,557	4,794	6,944
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
March	40,134	47,895	18,528	20,458	18,652
January-February	66,284	58,581	44,246	23,875	18,652
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 4/:					
Production:					
March	911	2,234	2,137	2,564	2,462
January-February	2,188	1,662	3,534	3,270	3,509
Year	-	107,402	124,334	112,241	98,929
Imports:					
March	200	1,143	308	135	87
January-February	882	317	2,522	374	2,089
Year	-	6,773	6,308	6,739	3,174

(Table continued on next page)

Major Indicators of U. S. Supply of Fish Meal, Solubles, and Oil, March 1964 (Contd.)					
Item and Period	1/1964	1963	1962	1961	1960
	..... (1,000 Lbs.)				
Fish Oils:					
Production:					
March	584	452	440	493	592
January-February	2/945	849	1,177	829	1,101
Year	-	185,827	250,075	258,118	209,143
Exports:					
March	222	44,384	19,167	5,644	3,157
January-February	23,698	2,537	22,156	30,905	25,896
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.

2/Preliminary data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/Includes homogenized fish.

* * * * *

Major Indicators for U. S. Supply of Fish Meal, Solubles, and Oil, February 1964					
Item and Period	1/1964	1/1963	1962	1961	1960
	..... (Short Tons)				
Fish Meal:					
Production:					
January	2,487	2,285	2,941	2,723	3,828
February	1,242	2,847	3,616	2,071	3,116
Jan.-Dec.	-	229,646	298,413	291,337	270,343
Year 2/	-	241,646	311,232	311,265	290,137
Imports:					
January	-	18,495	25,427	9,531	8,571
February	-	40,086	18,819	14,344	8,081
Year	-	383,107	252,307	217,845	131,561
Fish Solubles 3/:					
Production:					
January	1,240	1,441	1,808	1,620	1,697
February	642	1,223	1,726	1,650	1,812
Year	-	96,224	124,334	112,241	98,929
Imports:					
January	-	148	273	219	214
February	-	169	2,249	155	1,875
Year	-	6,773	6,308	6,739	3,174
Fish Oils:					
Production:					
January	396	424	763	489	534
February	549	324	408	366	554
Year	-	184,009	255,808	266,668	215,653
Exports:					
January	-	79	509	13,449	2,068
February	-	2,458	21,647	17,456	23,828
Year	-	262,342	123,050	122,486	143,659

1/Preliminary data for 1963 and 1964 based on reports which accounted for the following percentage of production in 1962: Fish meal, 93 percent; solubles and homogenized fish, 97 percent; and fish oils, 95 percent.

2/Small amounts (10,000 to 25,000 tons) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

3/Includes homogenized fish.



Inventions

MECHANICAL FISHING VESSEL UNLOADER BEING DEVELOPED:

A new mechanical unloader for unloading fish from fishing vessels has been designed by a member of the New Bedford Institute of Technology, and it is being built by a firm in New Bedford, Mass.

The device is lowered into the fish hold where the fish are scooped up into buckets fastened to an endless chain conveyor. The bucket conveyor lifts the fish to deck level where they are deposited onto a belt conveyor and carried up to the wharf. The new type fish unloader was expected to be ready for trial by the end of May 1964.



Investment Opportunities

PHILIPPINE FISHING INDUSTRY:

A sizable unsatisfied domestic market for fish, coupled with an export potential, suggests the possibility of investment opportunities in the Philippines for United States fishing interests. One such opportunity, among others, is the joint venture to exploit the fishing resources of Philippine coastal waters proposed by a Manila group. That group, which has wide-spread interests, has already rigged a tugboat for purse-seining and is negotiating for the acquisition of tidal flats for fish and shrimp culture.

Although a Commission of Fisheries was established in 1963 to promote a program designed to make the Philippines self-sufficient in fish production, the Philippine fishing industry has long been handicapped by antiquated methods, inadequate facilities, and lack of investment capital. Philippine imports of fish, largely canned sardines from South Africa, are running at the rate of around 38,000 metric tons a year. Because of the unsatisfied domestic demand, Philippine exports of fish have been negligible.

United States firms, desiring to obtain additional information about the potential of the fishing industry in the Philippines and about specific investment opportunities there, are invited to write to the Bureau of International Commerce, Office of International Invest-

ment, File 4-0910-4H, Department of Commerce, Washington, D. C. 20230. (International Commerce, June 1, 1964.)

* * * * *

AID ABSTRACTS AVAILABLE AT DEPARTMENT OF COMMERCE FIELD OFFICES:

More than 1,200 studies of investment opportunities have been collected, abstracted, and organized into a card system by the U.S. Agency for International Development (AID). Copies of the new catalog of investment opportunities have been placed in U.S. Department of Commerce field offices in 40 cities.

Now a potential investor can simply go to the nearest Commerce Department field office and run through Keysort cards to pick out the type and location of the investment he has in mind, and then read the abstracts. Should he desire to read one of the reports in its entirety, he can obtain a copy at cost through the field office or from the Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20230.

Where the original study contains sufficiently detailed information, each abstract card contains specific information on the market, total capital required, projected annual sales, production, finance, profitability, manpower, location, and other relevant data. In other cases, the abstract card contains only a general description and summary.

Indexes of the investment studies breaking them down by industry and country are available free of charge at the Commerce field offices or by writing to AID's Office of Development Finance and Private Enterprise, Agency for International Development, Washington, D.C., 20523.

Some of the studies were made with AID help and some were sponsored by international banks, foreign governments, foundations, universities, and private firms.

In making the catalog of investment opportunities widely available, AID is not vouching for the opportunities it contains, but presenting information to investors who wish to know what studies have already been done in their fields of interest.

Studies of investments involving food and kindred products account for more than those on any other single subject. There are 188 such reports. In second place are the 120 studies on business opportunities for producing chemicals and allied products.

There are more surveys (86) dealing with the Philippines than any other nation. In second place is Taiwan with 77, followed by Nigeria with 66, Pakistan with 50, and India with 46.

The AID Office of Development Finance and Private Enterprise has arranged to keep the system up to date. AID Missions throughout the world will engage in a continuous process of seeking new studies of investment possibilities and will report them regularly, so they can be added to the existing card system. Those becoming obsolete will be removed. (International Commerce, May 25, 1964.)



Irradiation Preservation

IRRADIATION OF FISH AT SEA:

For the preservation of fish at sea, arrangements were completed in May 1964 to

install a pilot-model cobalt-60 irradiator aboard the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The object of the irradiation experiments at sea is to show that it will result in two important advances: (1) that the quality of fish landed will be significantly higher than that of nonirradiated fish, and (2) that fishing vessels can extend their stay at sea when additional time is needed to make up a full load.

The experiments are part of the research on the irradiation of fishery products conducted by the Bureau's Technological Laboratory at Gloucester, Mass., the home port of the Delaware. Five of the research vessel's trips in 1965 are tentatively scheduled to include laboratory personnel associated with the irradiation programs.

Note: See Commercial Fisheries Review, January 1964 p. 19; February 1963 p. 43.



Maryland

CHESAPEAKE BAY "FISH-KILL" CONTROLS ESTABLISHED:

The Maryland State Natural Resource Board has established procedures for dealing with fish losses in Chesapeake Bay. The Board has arranged: (1) close coordination between State agencies when fish kills occur, (2) a weekly survey of Maryland waters to note any kills, and (3) a research program on the causes of catastrophic fish mortalities.

It has been requested that all heavy fish kills in the Chesapeake area be reported to the Maryland State Department of Chesapeake Bay Affairs. That department coordinates all reports and calls in other agencies and groups when their assistance is needed.

Water conditions are being checked weekly in areas where heavy losses have been seen in past years. The plane of the Department of Chesapeake Bay Affairs began weekly flights June 1, 1964, over the Potomac, Patuxent, Patapsco, Middle, Back, and Choptank Rivers, Tangier Sound, Eastern Bay, and the Maryland portion of the open Chesapeake Bay. In addition, the Maryland State Department of Water Resources research vessel Monitor is taking weekly samples of water at 15 locations between Rock Hall and Herring Bay, an area where fish have died during many summers. Special additional trips are scheduled

when needed. The Monitor is being equipped for automatic data recording and simultaneous sampling of temperature, salinity, oxygen, acidity, and turbidity.

Research on suspected causes of fish kills is scheduled to begin in the summer of 1964 at the University of Maryland's biological laboratories at Solomons Island and College Park.

The research will include a study of the bacteria which killed tremendous numbers of white perch and some other species in 1963, and an investigation of changes in temperature, oxygen, and other environmental conditions which may have caused many of the past fish kills.

It is believed that the heavy fish losses in 1963 will not be repeated in 1964, since the more susceptible fish were killed, and the conditions favoring fish destruction are unlikely to occur in the same patterns in a succeeding year. White perch are widespread and in fairly good supply this year, despite the heavy losses in 1963. There is no indication of any danger to swimmers or other people using Chesapeake Bay waters.



Mississippi

MISSISSIPPI SOUND POSTLARVAL SHRIMP STUDIES CONTINUED:

The study of postlarval shrimp in Mississippi Sound by the Mississippi State Gulf Coast Research Laboratory continued during March-May 1964. Young brown shrimp appeared early in the year and were more abundant than in 1963. After the peak was reached in April, the number of postlarval shrimp dropped sharply and remained below the 1963 levels since the first of May. Early growth was slow but increased after the water warmed, and it appeared likely that opening of the season would be delayed. Young white shrimp were about a week later this year and numbers were a little higher. (Gulf Coast Research Laboratory, June 2, 1964.)

Note: See Commercial Fisheries Review, May 1964 p. 25.

STATE GULF COAST RESEARCH LABORATORY RECEIVES GRANTS:

A grant of \$85,700 to the Mississippi State Gulf Coast Research Laboratory by the Na-

tional Science Foundation was announced April 25, 1964. The money is to be used for the purchase of equipment for the Laboratory's oceanography building which was then under construction.

In May, the National Science Foundation awarded another grant of \$11,100 to the Laboratory for Summer Research. That money will go as payments to students who will be selected by a board after they have attended classes at the laboratory. (Gulf Coast Research Laboratory, June 2, 1964.)



North Atlantic Fisheries Investigations

SEA SCALLOP POPULATION SURVEY ON GEORGES BANK CONTINUED:

M/V "Albatross IV" Cruise 64-7 (May 13-22, 1964): To collect quantitative samples of the sea scallop population on the eastern part of Georges Bank was the main purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

Operations included 180 tows (of 10 minute duration) with a 10-foot scallop dredge equipped with an odometer, and 10 drags with a 10-foot beam trawl. An underwater camera was attached to the beam trawl during one transect. In another instance, the underwater camera was lowered into a sonar target area. In addition, 200 bathythermograph casts were made.

Note: See Commercial Fisheries Review, August 1963 p. 41.

BLACKBACK FLOUNDER TAGGING PROGRAM:

The Massachusetts State Division of Marine Fisheries and the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., have completed the first phase of a cooperative tagging program. Using Bureau tags, Massachusetts State biologists tagged 7,000 blackback flounders while working aboard chartered otter trawlers in Massachusetts coastal waters north and south of Cape Cod. Bureau biologists aboard the Albatross IV tagged 2,400 fish on Nantucket Shoals and Georges Bank. Through May 1964, about 500 tagged fish had been recovered. Of those, 460 had originally been released in in-shore waters and 40 had been released off-

shore. All recaptured fish were taken in the area of tagging.

RETURN OF UNMARKED OCEANIC INSTRUMENTS REQUESTED:

The rate of return of instruments thrown overboard to rest on the bottom without either a surface or subsurface marker buoy is being

\$25 REWARD

WILL BE PAID FOR THE RECOVERY OF THESE INSTRUMENT CASES.

IF FOUND IN YOUR NETS, BRING THEM TO ANY REPRESENTATIVE OF THE

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF COMMERCIAL FISHERIES

OFFICES LOCATED IN THESE CITIES & TOWNS.

PROVINCETOWN MASS.

WOODS HOLE, MASS.

NEW BEDFORD, MASS.

BOSTON, MASS.

GLOUCESTER, MASS.

ROCKLAND, ME.

NEW YORK, N.Y.

PORTLAND, ME.



tested by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass. Ten dummy units were put out on Georges Bank in May 1964. Signs offering a \$25 reward for their return have been posted at the Boston Fish Pier and the New Bedford auction room. Handbills offering the reward have been distributed at other ports in New England and eastern Canada. If the experiment is a success and most of the dummy units are returned, scientists plan to put thermographs in pressure cases and set up a program to monitor bottom water temperatures continuously on various parts of Georges Bank.



Oceanography

WATER SAMPLING STUDIES IN CENTRAL PACIFIC OCEAN:

A second air flight around the island of Oahu in the Central Pacific Ocean was made on April 11, 1964, by staff members of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, when some 50 packages of drift cards were released. A total of 8 returned drift cards by the end of April, from this second flight and a previous flight, showed that the water being sampled at Koko Head during April had its origin to the south or southwest of Oahu.

RESEARCH VESSELS OF UNIVERSITY OF MIAMI NOT SUBJECT TO UNION RULES:

The Institute of Marine Science, University of Miami, is not subject to the National Labor Relations Act in the employment of seamen on its oceanographic research vessels, announced the Institute's Director this past May. That decision was handed down by the National Labor Relations Board (NLRB), Washington, D. C., and affirmed a ruling made earlier at a Miami hearing.

The case arose after the Seafarers International Union filed a petition with the NLRB, alleging that the union represented a majority of the unlicensed seamen aboard the Institute's research vessel *Pillsbury*. The union asked that an election be ordered among the oceanographic vessel's crew to determine whether or not they should be unionized.

The NLRB decision--that the Institute and all its research vessels are not subject to NLRB jurisdiction (and are therefore, in effect, exempt from unionization attempts by the Seafarers Union)--is based on the fact that the University of Miami is a nonprofit educational institution.

In its decision, NLRB stated: "The University of Miami, Institute of Marine Science, although performing research for, and substantially supported by, the Federal Government, is first and foremost an educational institution for the advanced study of oceanography. Its research activities contribute directly to its curriculum and program for the practical training of scientists in this field. Hence, this research program is an integral

aspect of the Institute's overall educational function. We conclude, therefore, that the activities of the Institute, including its research program, are primarily educational rather than commercial in character, and we decline to assert jurisdiction herein. Accordingly, we shall dismiss the petition."

The Institute Director stated that the Institute's research expenditures amounted to more than \$2.7 million in 1963--almost one-third of the total spent on research by the entire University of Miami. The Institute of Marine Science has two large seagoing research vessels, the Pillsbury and the Gerda, plus numerous smaller craft. The 176-foot Pillsbury, newest of the fleet, has already logged more than 25,000 miles at sea and has been making a study of the Gulf of Guinea, along the coast of West Africa. The 75-foot Gerda, a converted North Sea trawler, has been doing research in the Gulf Stream and on the Bahama Banks. (Institute of Marine Science, University of Miami, May 13, 1964.)

DEEP-DIVING SUBMARINE FOR OCEANOGRAPHIC RESEARCH COMMISSIONED BY WOODS HOLE OCEANOGRAPHIC INSTITUTION:

The Alvin, a 22-foot oceanographic research submarine designed to dive 6,000 feet into the ocean, was commissioned June 5, 1964, by the Woods Hole (Mass.) Oceanographic Institution.

A thorough check of all of the installed systems will be made both before and during initial sea trials, and an extensive operator training period in shallow water is planned prior to testing the craft to the design depth of 6,000 feet in the summer of 1964.

Note: See Commercial Fisheries Review, April 1964 p. 25.

GRANTS AWARDED UNIVERSITY OF MIAMI FOR SEA FLOOR STUDIES:

Two new grants totaling \$348,000 to be used for studies of the ocean floor were received by the Institute of Marine Science, University of Miami, Miami, Fla., announced the Institute Director this past May. The grants, which involve geological investigations of the bottom sediments and the topography of the sea floor, were awarded by the National Science Foundation.

The Institute's scientists will operate from the Institute's 176-foot oceanographic research

vessel, the Pillsbury. Active work on the new projects will begin as soon as the vessel completes its assignment off the coast of West Africa, where Institute scientists were making studies of the Gulf of Guinea.

Most of the work on the sea floor projects will be done in the Caribbean Sea as previous studies indicate that this is one of the best places to obtain undisturbed bottom sediments extending back a million years or more. Such sediments consist mainly of Globigerina-ooze, composed of the shells of microscopic planktonic organisms which live in surface layers of the sea. After the organisms die, their shells sink to the bottom. Analysis of the sediments reveals the changing climatic conditions during the Pleistocene epoch. Through oxygen isotopic studies made at the Institute of Marine Science, investigators have succeeded in tracing the changes in temperature of surface waters back some 375,000 years. The new study, it is hoped, will extend the record back even farther in geologic time and reveal the pattern of changing conditions throughout the Pleistocene.

The topographic studies of the ocean floor will be concerned primarily with an effort to learn more about the origin, composition, and shape of the abyssal hills--unique hills averaging about 1,200 feet in height which cover half the entire ocean floor. Some geologists believe the abyssal hills may be composed of basalt from the earth's lower crust.

The University of Miami team will investigate in detail some typical abyssal hill fields between Bermuda and Puerto Rico. The distribution of hills within selected areas will be studied, and the shapes of particular hills investigated in detail with a view to mapping their topography. Samples of the hills and the surrounding areas will be taken by coring. (Institute of Marine Science, University of Miami, May 6, 1964.)



Oregon

STEELHEAD PLANTED IN YAMHILL RIVER:

A total of 256 adult spawning winter steelhead trout were transplanted to the Yamhill River system in May 1964 from the Oregon Fish Commission's Dexter holding pond on the Middle Willamette River. Transplanting

the adult spawners to the Yamhill and letting nature rear the young of the transplanted fish to downstream migrant size will help build up the winter steelhead population of the system.

Until recently, poor seasonal passage conditions at Willamette Falls as well as Lafayette Dam on the lower Yamhill had blocked the fish production potential of the river. In late 1963, a Yamhill County crew, with the assistance of Oregon Fish Commission engineers, breached the obsolete Lafayette Dam in an effort to provide access to the upriver spawning areas.

Experimental releases of both steelhead and silver salmon fingerlings in the Yamhill by the Fish Commission during the past several years have demonstrated the suitability of the system for rearing the fish to downstream migrant size. The Oregon Game Commission early in 1964 liberated some 130 adult steelhead in the Yamhill system from the surplus returning to its Alsea hatchery. The additional steelhead transplant from the Middle Willamette, coupled with progress in planning and negotiations for new upstream passage facilities over Willamette Falls at Oregon City, has brightened the future outlook for the development of a worthwhile steelhead run on this readily accessible lower Willamette tributary. (Oregon Fish Commission, May 20, 1964.)



Salmon

COLUMBIA RIVER SUMMER FISHERY POSTPONED:

The Columbia River summer commercial salmon season did not open June 16, 1964, as previously scheduled. The decision to delay the opening was the result of joint action taken by the Washington State Department of Fisheries and the Oregon State Fish Commission at a public hearing in Portland, Oreg., on June 10. The late spring runoff brought the Columbia River to near flood stage, effectively stopping the migration of chinook salmon. A fishery on those stationary fish in muddy water would take more salmon than should be harvested from the run.

When a migration rate of 1,500 chinook salmon a day over Bonneville Dam showed that the salmon are on the move once again, an opening day for the commercial fishery

was to be set. (Washington State Department of Fisheries, June 12, 1964.)



Shellfish

ANESTHETIC MAY AID BIOLOGICAL RESEARCH:

A proposed shellfish anesthetic has been investigated by the U.S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn. The experiments involved propylene phenoxetol, a colorless, oily, nontoxic liquid that has been reported effective as an anesthetic for shellfish. A drug which would permit experimental manipulation of completely relaxed but living mollusks would be of great value for anatomical and physiological investigations.

Actively pumping hard clams (*M. mercenaria*) were exposed to varying concentrations of propylene phenoxetol in sea water. At drug levels of 0.5 to 1 percent, about 20 percent of the treated clams gaped, because completely relaxed, and could be freely handled. Shortly after being returned to normal sea water, they showed complete recovery.

In another experiment, clams, oysters, and mussels were anesthetized by hypodermic injection into the mantle cavity, but high mortality followed the direct injection treatment.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, MAY 1964:

Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off)					
Total landings, So. Atl. and Gulf States:					
July	-	19,767	12,294	10,500	21,746
June	-	13,161	11,309	8,233	12,427
May	8,400	10,152	6,186	5,276	6,335
April	5,016	4,427	3,358	3,171	4,728
January-March ..	14,878	11,611	11,294	14,350	13,285
January-December	-	138,281	105,839	91,396	141,035
Quantity canned, Gulf States 1/:					
July	-	3,726	3,551	2,793	5,802
June	-	5,234	4,913	3,438	6,920
May	900	3,831	1,794	1,208	1,461
April	-	105	12	9	66
January-March ..	584	842	819	308	587
January-December	-	29,468	23,322	14,500	26,394
Frozen inventories (as of end of each mo.) 2/:					
July 31	-	25,460	13,677	14,849	17,397
June 30	-	24,047	13,796	19,416	15,338

(Table continued on next page)

Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off)					
Frozen inventories (as of end of each mo.) 2/:					
May 31	-	24,053	13,904	24,696	17,540
April 30	28,950	24,954	15,637	27,492	20,502
March 31	31,428	27,970	16,607	31,345	23,232
February 29	35,303	28,039	19,012	37,612	29,063
January 31	43,752	28,487	21,328	37,842	34,332
Imports 3/:					
July	-	11,002	8,265	6,635	7,319
June	-	9,439	9,397	8,065	8,932
May	-	11,110	11,020	8,278	9,902
April	12,886	11,082	10,210	9,208	7,733
January-March ..	37,739	38,855	33,169	31,617	24,798
January-December	-	151,530	141,103	126,268	113,418
Ex-vessel price, all species, So. Atl. and Gulf Ports: ... (¢/lb., 26-30 Count, Heads-Off) ...					
July	-	63.5	82.1	55.8	54.6
June	-	77.0	84.4	53.7	64.1
May	4/59-62	80.9	83.7	52.8	62.9
April	4/57-61	83.6	82.2	55.4	60.6
March	4/57-61	85.5	80.9	56.0	56.3
February	4/57-62	85.7	78.9	53.5	51.8
January	4/57-69	85.0	76.3	52.5	49.5
Wholesale price, froz. brown (3-lb. pkg.), Chicago, Ill.:					
July	-	77-97	-	70-75	72-77
June	-	95-102	102-104	67-72	76-77
May	72-78	100-103	98-103	67-69	74-77
April	71-74	100-105	94-97	69-70	74-75
March	72-75	102-106	94-95	69-71	65-68
February	73-82	102-106	93-95	69-71	65-67
January	78-83	102-106	91-94	69-71	64-66

1/ Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.

2/ Raw headless only; excludes breaded, peeled and deveined, etc.

3/ Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/ Range in prices at Tampa, Fla.; Morgan City, La.; and Port Isabel and Brownsville, Texas, only.

Note: May 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



South Atlantic and Gulf of Mexico

SOVIET FISHING ACTIVITY:

Fifteen Soviet vessels fishing off North Carolina and Virginia with large mid-water trawls were spotted during March and April 1964. Soviet fishing vessels were seen periodically in the Gulf of Mexico. In June some of them were seen 20 miles off Tarpon Springs, Fla. It was reported that Soviet activities in the Gulf appeared to be of an exploratory nature--with evidence of increasing effort. It was believed some of those vessels were based in Cuba.



South Atlantic Exploratory Fishery Program

BOTTOMFISH EXPLORATIONS CONTINUED:

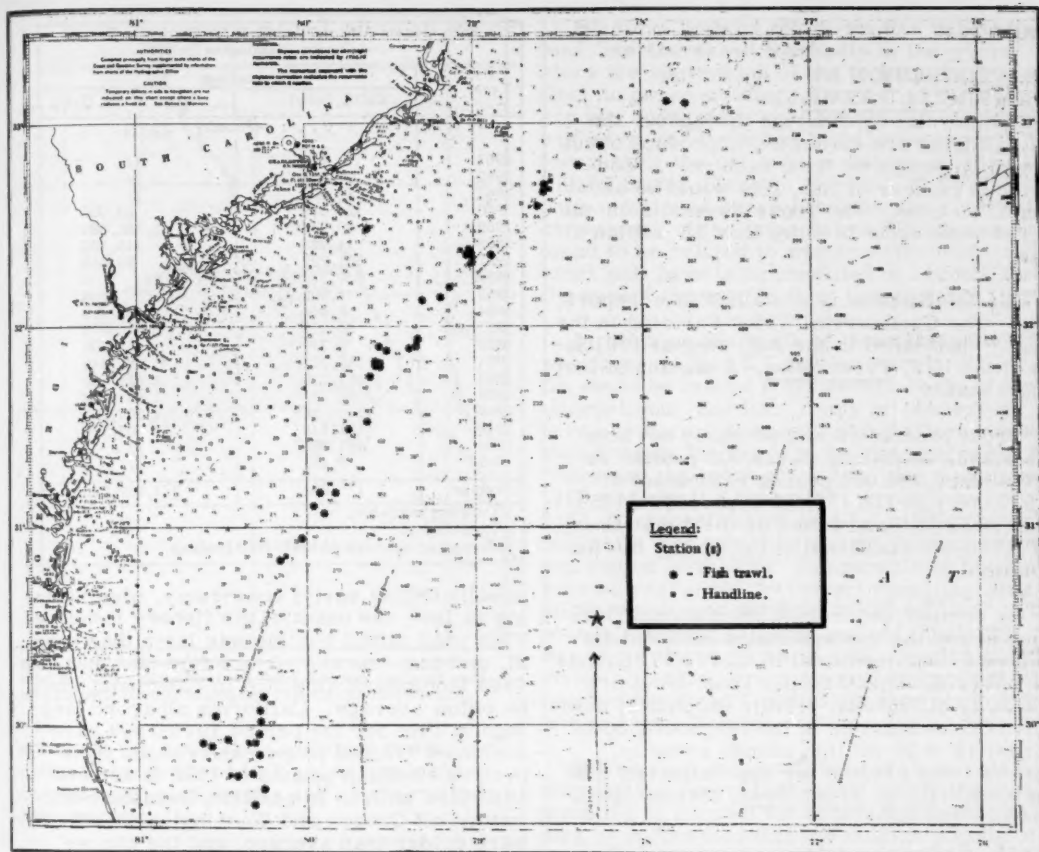
M/V "Silver Bay" Cruise 57 (April 30-May 19, 1964): To continue bottomfish explorations off South Carolina, Georgia, and northern Florida was the primary objective of this 20-day cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. A total of 68 exploratory fishing stations were occupied on the outer Continental Shelf. Exploratory gear consisted primarily of 50/70-foot, 4½-inch mesh and 70/90-foot, 2½-inch mesh roller-rigged fish trawls. The nets were fished on 8-foot bracket doors with 15-foot leglines. Cod-ends were 1½-inch mesh.

Trawling and sonic fish detection transects confirmed previous observations that the filefish (Stephanolepis hispidus) is presently the dominant fish, both numerically and by weight, in the 13- to 25-fathom depth range off much of the southeastern coast. Trawling in those depths east of St. Augustine, Fla., produced only small amounts of vermilion snapper (Rhomboplites aurorubens), red snapper (Lutjanus aya), and groupers mixed with 1,000- to 4,000-pound catches of filefish.

Limited trawling was done east of the Savannah (Ga.) light vessel to assess the seasonal availability of two fish populations located during previous Silver Bay cruises. In that area, pink porgies (Pagrus sedecim) and butterfish (Poronotus triacanthus) were still present in large numbers in trawl samples at 35-40 fathoms and 75-85 fathoms.

Snapper and grouper were taken throughout the survey area. Trawling in 24 fathoms in one area off South Carolina (32°40' N., 78°34' W.), produced small amounts of pink porgy, red snapper, red grouper (Epinephalus morio), scamp (Mycteroperca phenas), and gag (M. microlepis). Hand Lines fished for 3 hours in 31-34 fathoms at another South Carolina location (32°21' N., 79°02' W.), produced a 1,425-pound catch consisting of grouper, large red snapper, and amberjack.

Extensive midwater and near-bottom fish schools were recorded in 70 fathoms off St. Helena Sound, S.C. Catch results indicated that most of those schools consisted of round herring (Etrumeus sadina).



Note: See Commercial Fisheries Review, March 1964 p. 25.

Tagging

PATENTS AWARDED ON NEW METHODS FOR TRACKING FISH MIGRATIONS:

The patent rights on a newly developed device that may prove effective in more accurately following the migrations of salmon and other fish were recently received by the U.S. Department of the Interior.

Tagging programs are considered an essential part of scientific studies done on fish migrations. Recently, a patent on a new method of tagging young fish and later recovering them was awarded to two employees

of the Washington State Department of Fisheries.

A specially developed instrument, on which another patent is pending, inserts a tiny steel wire in the head of the fish. The wire is coded with strips of color or magnetic bits of information, which the fish carries as it moves about. Electronic equipment installed in fish-processing establishments separates the tagged fish from untagged fish and the wires are then extracted for scientific study. The process was originally developed to evaluate Columbia River salmon resources. (Science News Letter, May 2, 1964.)



Trout

U.S. PRODUCTION BY COMMERCIAL FARMS:

Commercial trout farms throughout the United States are estimated to produce about 5½ million pounds of trout each year. Converted to number of fish, this would be about 25 million trout. The gross income from the sale of those trout is more than \$5 million a year.

This information is contained in a report titled "The Commercial Trout Farming in the U.S.A.," published in the July-August 1961 issue of the U.S. Trout News. A portion of that report stated:

"Trout production was probably not less than 5,333,000 pounds (3,125,000 pounds reported and 2,188,000 pounds estimated) or 24,987,000 fish (12,481,000 reported in 1959, 3,750,000 additional based on the 1954 survey, and 8,756,000 additional estimated by the Association)."

"By comparison in 1958 the Federal Government and the various states involved distributed a combined total of 12,771,770 pounds of trout (175,602,250 fish). Thus, trout production by all means, private and public, in the United States must be in the neighborhood of at least 18 to 20 million pounds annually. Rainbow trout account for approximately ¼ of this total." (U. S. Trout News, March-April 1964.)



Tuna

1964 ALBACORE AND BLUEFIN TUNA CATCH FORECAST FOR UNITED STATES PACIFIC COASTAL AREA:

Following is a report by the staff on the Tuna Forecasting Program of the U.S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, concerning the expected catch during 1964 in the temperate tuna fishery of the eastern Pacific Ocean:

Albacore: During 1963 additional research indicated a relationship between oceanic conditions and the onset of the albacore fishery. Normally, in the temperate eastern Pacific, the ocean changes from winter cooling to spring heating in early March. In years when the change occurs early, the albacore fishery

Early-Season Albacore Landings for California (June) and Oregon-Washington (July)		
Year	Landings	
	Calif. (June)	Oreg.-Wash. (July)
	..... (Pounds)	
1963	2/0	1/
1962	28,414	1/
1961	35,603	1/
1960	126,383	23,007
1959	50,976	1,881,881
1958	14,228	415,892
1957	511,799	94,468
1956	210,527	0
1955	16,002	0
1954	2,866	0
1953	97,258	0
1952	6,299	14,509
1951	157,917	95,145
1950	1,143,139	3,819,132
1949	82,747	1,401,712
1948	85	4,505,801
1947	415,849	2,303,505
1946	424,082	1/
1945	6,175	1/
Average	175,282	3/1,039,646

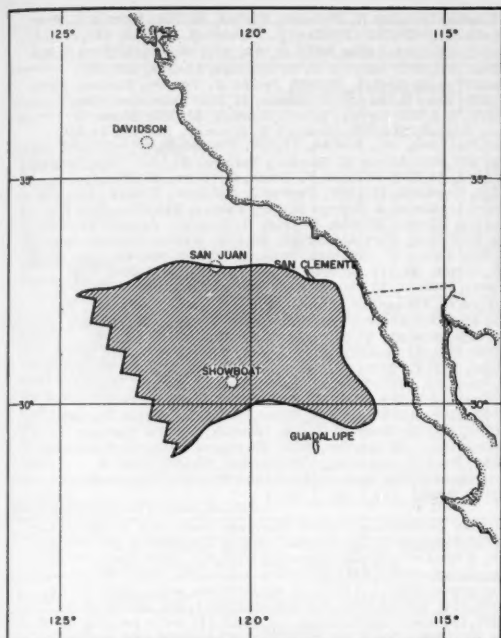
1/Data not available.

2/Preliminary.

3/Computed on basis of 1947-1960 landings.

usually begins early; conversely, when heating is late, the onset of the fishery is delayed. This year initial heating was later than usual, and consequently, it was forecast that June 1964 landings of albacore in California would be below average. California albacore landings in June for the period 1945-1963 have averaged 175,282 pounds and ranged from over one million pounds in 1950 to zero in 1963 (see table). In addition, because ocean waters off Oregon and Washington in 1964 were colder than average, and the change from cooling to heating was also late in that area, it was estimated that July 1964 albacore landings in those States would also be below average (see table).

The forecast called for the best albacore fishing in July 1964 off southern California to be located in approximately a rectangle area extending roughly from 30° N. latitude to a line running west through San Clemente and San Juan Islands. The western boundary of that area should be in the vicinity of 124° W. longitude (see chart on following page). The area begins some 30 to 50 miles offshore and encompasses the offshore waters between San Clemente Island and just north of Guadalupe Island. It was indicated that good fishing for albacore could extend to Guadalupe. That area was plotted from April 1964 temperature and salinity data taken at a depth of 10 meters. As a result of an unusually intense upwelling affecting temperature and salinity



Cross-hatched region delineates the area expected to produce about two-thirds of the total July 1964 albacore catch off southern California (United States) and Baja California (Mexico).

data along the southern California coast, the predicted area of good albacore fishing may not represent sufficiently the southern limit of the fishery.

The estimate of the 1964 albacore catch is restricted, as in previous years, to the amount that will be taken south of the International Border between the United States and Mexico. The basis of that prediction is the apparent relationship between water temperature at selected shore stations during the winter months and the catch the following summer of albacore off Baja California and bluefin off southern California. In "cold" years both species generally occur farther south and in "warm" years, farther north. It is expected that about 9.8 million pounds of albacore will be caught in 1964 from waters south of the United States-Mexican Border, which is below the 1945-1962 average albacore catch of 14.2 million pounds. In 1963, it was estimated that the landings from south of the International Border would be slightly less than average. Preliminary data indicate that about 7 million pounds were taken.

Bluefin: Fishing effort devoted to bluefin tuna has increased markedly in the years since the conversion of the tropical bait-boat fleet to purse-seining. Conduct of the fishery has apparently changed also in less obvious ways, for there has been little success in forecasting the catch from waters north of the United States-Mexican Border. The relationship mentioned above (whereby the bluefin catch north of the International Border was found to be related to winter water temperature) will have to be modified to account for the recent changes in fleet composition.

In 1962, on the basis of historical data, it was forecast that 5.7 million pounds of bluefin would be landed from waters north of the International Border. Entry of converted purse seiners increased fishing effort more than 3 times the average for the preceding 10 years and the catch of 17.0 million pounds in 1962 was about 3 times that predicted. In 1963, it was estimated that 7.7 million pounds of bluefin tuna would be caught from the northern region with effort comparable to pre-conversion years, but that effort equalling 1962 might result in a catch of 15-20 million pounds. Effort, although not yet tabulated, was about the same as in 1962. Preliminary statistics indicate, however, that the fleet still caught only about 7 million pounds north of the International Border.

Based upon the catch-temperature relationship for the years 1945-1959, and without attempting to correct for increased fishing effort, it is forecast that 9.6 million pounds of bluefin will be landed in 1964 from waters north of the United States-Mexican Border. That is 2.7 million pounds more than the average for the years 1945-1959.

Early Season Surveys: The U. S. Bureau of Commercial Fisheries research vessel Black Douglas and the California Department of Fish and Game research vessel N. B. Scofield departed the latter part of May 1964 in a joint preseason albacore oceanographic survey. On May 1, Navy picket vessels began trolling for albacore at offshore stations.

Radio broadcasts were made to the fishing industry on the results of those early season studies. A radio report from the M/V Black Douglas stated that the first albacore were caught on June 7. A total of 61 albacore (ranging from 5 to 15 pounds) were caught in water 63° to 65° F. about 120 miles west-southwest

of Erben Bank, a seamount located about 1,000 miles due west of San Diego. The vessel report said that the tugboat Elaine Foss also caught 2 albacore on the same day in 65° F. water about 250 miles west of the area where the Black Douglas located the fish. The M/V N. B. Scofield reported catching one 13-pound albacore in 60° F. water on June 9, about 400 miles west of Point Conception. Radio broadcasts were being made daily by the research vessels until July 6, to provide information on the shoreward movement of the summer albacore movement.

Note: See Commercial Fisheries Review, July 1963 p. 55.



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, APRIL 1-JUNE 30, 1964:

From the beginning of the program in 1956 through June 30, 1964, a total of 1,487 loan applications for \$39,840,256 were received by the U. S. Bureau of Commercial Fisheries, the Agency administering the Federal Fisheries Loan Fund. Of the total, 791 applications (\$17,802,763) had been approved, 504 (\$12,270,419) had been declined or found ineligible, 171 (\$6,394,505) had been withdrawn by the applicants before being processed, and 21 (\$1,406,700) were pending. Of the applications approved, 299 were approved for amounts less than applied for. The total reduction was \$1,965,869.

The following loans were approved from April 1, 1964, through June 30, 1964:

New England Area: James M. White, Peace Dale, R. I., \$4,340; Skipjack Fishing Corp., New Bedford, Mass., \$50,000; Stanley Ripley, Matinicus Island, Maine, \$2,000; Wallace K. Arey, Camden, Maine, \$1,600; Robert L. Goodspeed, Trevett, Maine, \$3,248; and Edward E. Benner, Jr., Round Pond, Maine, \$7,500.

California: Joseph A. Gann, et al, San Diego, \$131,200; William A. McPhee, Moss Landing, \$13,580; Eugene A. Smith, Leleton, \$2,000; San Juan, Inc., San Diego, \$690,000; Richard Robertson, Shell Beach, \$10,449; James Friscia, San Francisco, \$3,800; and Emerson Simmons, San Francisco, \$6,000.

South Atlantic and Gulf Area: Carl Lewis, Cape Charles, Va., \$3,000; James Strickland, Freeport, Tex., \$14,400; Eddie S. Gilden, Aransas Pass, Tex., \$21,787; and John Ross, Biloxi, Miss., \$15,752.

Great Lakes Area: Harold Lamb, Rogers City, Mich., \$4,000.

Pacific Northwest Area: William M. Suryan, Anacortes, Wash., \$9,160; David W. Carr, Seattle, Wash., \$5,000; Ora L. Olson, Snohomish, Wash., \$45,000; Ottar G. Larsen, Seattle, Wash., \$32,000; Nate Smith, Brookings, Oreg., \$5,000; Floyd D. Furlford, Westport, Wash., \$25,000; Knute Hillman, Seattle, Wash., \$4,000; Allen K. Rhoades, Bay Center, Wash., \$6,299; Peter C. Rosberg, Burton, Wash., \$35,000; Roy E. Johnson, Seattle, Wash., \$59,000; Jack D. Durham, Seattle, Wash., \$17,400; Lloyd N. Whaley, Seattle, Wash., \$45,000; and Tony Franulovich, Anacortes, Wash., \$6,000.

Alaska: Douglas R. Putansu, Kodiak, \$6,000; Donald B. Foster, Kodiak, \$20,000; William R. Berestoff, Kodiak, \$42,000; Emil C. Christensen, Koonak, \$18,500; Pete & Bill Walkoff, Kodiak, \$28,000; Bennett G. Groteclose, Kodiak, \$11,000; James Veatch, Kodiak, \$6,000; James E. Veazey, Kodiak, \$17,000; John R. Boggs, Ouzinkie, \$1,300; Jefferson Grey, Kodiak, \$25,000; Egbert Intvelt, Kodiak, \$1,500; Elmer E. Dean, Kodiak, \$13,000; Richard D. Kramer, Kodiak, \$4,800; Hans P. Olsen, Jr., Kodiak, \$70,000; Eugene N. McLeod, Kodiak, \$27,000; Aaron W. Bauder, Palmer, \$8,120; Turi Kivisto, Cordova, \$4,280; William F. Smith, Cordova, \$9,000; J. A. Rollin, Cordova, \$11,486; Ernest J. Galliher, Kodiak, \$40,875; Robert I. Ditman & George Hillar, Valdez, \$36,000; Jack E. Crowley, Juneau, \$2,600; Charles R. Leshar, Juneau, \$9,200; Jess E. Padon, Port Alexander, \$8,316; Walter Cooper, Seward, \$14,000; LeRoy C. Hollman, Seward, \$8,970; Marvin Lyle Dragseth, Sutton, \$7,372; Arthur E. Foss, Kenai, \$16,000; Neil Sargent, Kodiak, \$3,200; Ben B. Sudduth, Ketchikan, \$4,500; Clifford E. Alexander, Homer, \$700; Adam J. Cichoski, Kodiak, \$5,000; Oliver & Samuel Selvog, Kodiak, \$3,776; Eli Metrokin, Kodiak, \$6,000; Larry S. Matfay, Old Harbor, \$4,500; Donald Hamilton, Ketchikan, \$9,500; Roy Will Allen, Haines, \$6,400; Morris Porter, Jr., Kenai, \$5,900; Trawlers, Inc., Seward, \$17,500; Charles R. Martin, Kodiak, \$4,880; William Yurioff, Kodiak, \$2,633; Peter P. Squartsoff, Kodiak, \$1,000; Gerasim Pestrikoff, Sitka, \$22,800; Martin Goresen, Seward, \$6,175; Duke R. Jones, Kodiak, \$3,525; Herman Andrewitch, Old Harbor, \$400; Raymond Kelly, Old Harbor, \$3,050; Paul N. Swenning, Old Harbor, \$6,000; Carl R. Christiansen, Old Harbor, \$650; and Edward Pestrikoff, Old Harbor, \$500.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the second quarter of 1964, a total of 5 applications for \$155,275 were received and 11 applications for \$381,809 were approved. Since the program began (July 5, 1960), 55 applications were received for \$4,896,614. Of the total, 44 applications were approved for \$2,970,221 and 3 applications for \$238,347 were pending as of June 30, 1964. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 11 (\$1,054,500), approved 8 (\$775,365).

California Area: Received and approved 1 (\$557,000).

South Atlantic and Gulf Area: Received 33 (\$1,384,090), approved 28 (\$1,075,336).

Pacific Northwest Area: Received 7 (\$1,846,250), approved 4 (\$507,546).

Alaska Area: Received 3 (\$54,774), approved 3 (\$54,774).

The large number of loan applications from Alaska during the period was the result of the March 27 earthquake there. In April, the Bureau of Commercial Fisheries opened an emergency Loan Office in Kodiak to arrange for loans to fishing vessel owners in the Kodiak area whose vessels or fishing gear were lost or damaged during the earthquake.

DOCUMENTATIONS ISSUED AND CANCELLED, MARCH 1964:

During March 1964, a total of 27 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 36 in March 1963. There were 39 documents cancelled for fishing vessels in March 1964, the same as in March 1963.

Table 1 - U. S. Fishing Vessels 1/-Documentation Issued and Cancelled, by Areas, March 1964 with Comparisons

Area (Home Port)	Mar.		Jan.-Mar.		Total
	1964	1963	1964	1963	1963
(Number)					
Issued first documents 2/:					
New England	-	1	2	4	23
Middle Atlantic	-	1	2	2	18
Chesapeake	4	3	9	6	66
South Atlantic	6	6	15	13	77
Gulf	13	17	50	40	239
Pacific	4	7	10	16	160
Great Lakes	-	1	1	1	5
Puerto Rico	-	-	-	-	2
Total	27	36	90	82	590
Removed from documentation 3/:					
New England	2	3	8	5	48
Middle Atlantic	-	5	3	15	47
Chesapeake	1	2	10	5	25
South Atlantic	5	4	15	14	53
Gulf	8	13	28	23	118
Pacific	20	11	35	26	87
Great Lakes	3	1	8	3	15
Hawaii	-	-	-	-	3
Total	39	39	107	91	396

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, March 1964 2/

Length	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)					
27 - 27.9	-	-	-	1	1
34 - 34.9	-	-	1	-	1
36 - 36.9	1	-	1	-	2
37 - 37.9	2	-	-	1	3
40 - 40.9	-	-	1	-	1
41 - 41.9	1	-	-	-	1
42 - 42.9	-	-	1	1	2
44 - 44.9	-	-	1	-	1
47 - 47.9	-	1	-	-	1
48 - 48.9	-	-	-	1	1
53 - 53.9	-	-	1	-	1
54 - 54.9	-	1	-	-	1
57 - 57.9	-	1	-	-	1
58 - 58.9	-	-	2	-	2
61 - 61.9	-	-	1	-	1
62 - 62.9	-	-	2	-	2
64 - 64.9	-	-	1	-	1
65 - 65.9	-	3	1	-	4
Total	4	6	13	4	27

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, March 1964 2/

Gross Tonnage	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)					
5-9	4	-	-	1	5
10-19	-	-	4	-	4
20-29	-	-	-	2	2
30-39	-	1	1	-	2
40-49	-	-	1	-	1
50-59	-	2	-	1	3
60-69	-	-	4	-	4
70-79	-	2	3	-	5
80-89	-	1	-	-	1
Total	4	6	13	4	27

Note: For explanation of footnotes, see table 4.

Table 4 - U. S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, March 1964 2/

Horsepower	Chesapeake	South Atlantic	Gulf	Pacific	Total
(Number)					
32	1	-	-	-	1
37	1	-	-	-	1
48	-	-	1	-	1
100	-	-	-	1	1
110	-	1	2	-	3
130	1	-	-	-	1
165	-	1	1	1	3
170	-	1	4	-	5
175	1	-	-	-	1
180	-	-	1	1	2
220	-	-	2	-	2
270	-	-	1	-	1
300	-	2	1	1	4
325	-	1	-	-	1
Total	4	6	13	4	27

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/There were no undocumented vessels in March 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 21 in 1964; 1 in 1961; 1 in 1958; and 4 prior to 1951.

3/Includes vessel reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA (BRINE) UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 30, 1964, amounted to 14,496,778 pounds (about 690,320 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, APRIL 1964:

United States imports of processed edible fishery products in April 1964 were down 6.5 percent in quantity and 5.4 percent in value from those in the previous month. There was a general decline in imports of most fish fillet items as well as canned sardines in oil and canned oysters. Imports were up for canned albacore tuna in brine, canned sardines not in oil, and canned crab meat.

Compared with the same month in 1963, imports in April 1964 showed little change in overall totals. A gain this April in imports of fish blocks and slabs, canned sardines not in oil, and canned crab meat was about offset by smaller ship-

U. S. Imports and Exports of Processed Edible Fishery Products, April 1964 with Comparisons

Item	Quantity				Value			
	Apr.		Jan.-Apr.		Apr.		Jan.-Apr.	
	1964	1963	1964	1963	1964	1963	1964	1963
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
Fish & Shellfish:								
Imports 1/ ..	40.3	40.6	168.3	165.3	12.2	12.3	49.4	47.0
Exports 2/ ..	3.0	1.6	14.9	12.6	1.7	0.8	6.4	4.9

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

ments of groundfish fillets, sea catfish fillets, canned tuna in brine, canned sardines in oil, and canned oysters.

In the first 4 months of 1964, imports were up 1.8 percent in quantity and 5.1 percent in value from those in the same period of 1963. During January-April 1964 there were larger imports of groundfish fillets, flounder fillets, blocks and slabs, sea catfish fillets, and yellow pike fillets. But imports were down for swordfish fillets, canned sardines in oil and not in oil, and canned tuna in brine.

Exports of processed edible fish and shellfish from the United States in April 1964 were up 20 percent in quantity and 70 percent in value from those in the previous month. In April, there was a sharp increase in exports of canned salmon as well as larger shipments of canned sardines not-in-oil. The gain was partly offset by a drop in shipments of canned mackerel and canned sardines in oil.

Compared with the same month of the previous year, the exports in April 1964 were up 87.5 percent in quantity and 112.5 percent in value. This April there were larger shipments of all leading canned fish export items except canned squid.

Processed fish and shellfish exports in the first 4 months of 1964 were up 18.3 percent in quantity and 30.6 percent in value from those in the same period of 1963. In January-April 1964 there were much larger shipments of canned mackerel and shipments of canned sardines in oil and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.

Notes: (1) Prior to October 1963, the data shown were included in news articles on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed fishery products are reported. The import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products." The export data in this series of articles have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, July 1964 p. 36.



U.S. Research Vessels

"DELAWARE II" TO BE BUILT AS NEW EXPLORATORY FISHING RESEARCH VESSEL:

A contract for the construction of a 155.5-foot fisheries research vessels has been awarded to a shipbuilding firm in South Portland, Maine, by the U. S. Bureau of Commer-

cial Fisheries. The vessel is to be operated by the Bureau's Exploratory Fishing Base, Gloucester, Mass., and will replace the veteran research vessel Delaware I and will continue fisheries investigation work in the North Atlantic.

The design and construction of the Delaware II will enable the ship to operate from subarctic regions to the tropics in all seasons. Stores and fresh-water provisions will allow the vessel to remain at sea for 30-day periods. Fuel oil capacity is sufficient to provide an 8,000-mile cruising radius. Air-conditioned quarters are provided for a complement of 6 scientists and 13 crew members. The Delaware II will be equipped with two laboratories and a special chartroom. To aid scientific investigations, the vessel will also be provided with sophisticated electronic fish-detecting equipment and an underwater television system for observing the operation of fishing gear and its effect upon fish.

Of special interest is the deck layout, featuring a new concept in stern trawling. The stern is fitted with a sloping ramp running from waterline to the main deck. A passage, 10 feet wide, extends the entire length of the vessel to the trawl winch, which is located forward. Those features allow the trawl to be hauled aboard in a single, fast, efficient operation. The deckhouse, through which the trawl passage runs, affords protection for the crew while working on the net and the catch. Capabilities for side trawling, long-lining, gill-netting, and purse-seining are also provided.

Facilities will be provided to allow future research on methods of preserving and processing fish at sea. Included are equipment for ice-making, brine- and blast-freezing, and irradiation. The vessel's insulated hold will have a 16-ton freezing capacity.

The principal specifications of the Delaware II are: length overall 155.5 feet, beam 30 feet, draft 11.5 feet, displacement (full load) 680 tons, and deadweight 180 tons.

The Delaware II will be powered by a 1,000 hp.-Diesel engine, driving a solid wheel through reduction gears, which will enable the vessel to cruise at 12.5 knots. Two 115-kilowatt a.c. generators will supply the vessel's regular power demand, as well as pow-

er for experimental fishing techniques, such as electro-fishing.

It is believed that the new vessel, in addition to efficiently carrying out the objectives of the Bureau's research programs, will provide an example to the United States fisherman of a modern concept in efficient trawler design.



Washington

SALMON TAGGING IN PUGET SOUND CONTINUED:

The purse-seiners Welcome, Victory, and Sykes have been chartered for salmon tagging during August and September 1964 in northern Puget Sound by the Washington State Department of Fisheries. The 3 vessels will operate during weekly 2- and 3-day closures of net fishing. They will tag fish at West Beach, Rosario Strait, Iceberg Point, Salmon

Banks, Lime Kiln, Mitchell Bay, and Stuart Island. Biologists from the Washington State Department of Fisheries will be on board the vessels at all times during tagging. The project is part of a continuing program to learn more about the migration patterns of adult salmon. (Washington State Department of Fisheries, May 29, 1964.)



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JUNE 1964:

There was only a slight increase (0.2 percent) from the previous month in the June 1964 wholesale price index for edible fish and shellfish (fresh, frozen, and canned). But prices for most salt-water fishery products this June were higher than in May. Processed frozen fish and shellfish was the only subgroup index that rose from May to June, solely because of higher frozen shrimp prices in June. At 105.6 percent of the 1957-59 average, the index this June was 7.7 percent lower than for the same month a year earlier. June 1964 prices for most items were generally lower than in June 1963.

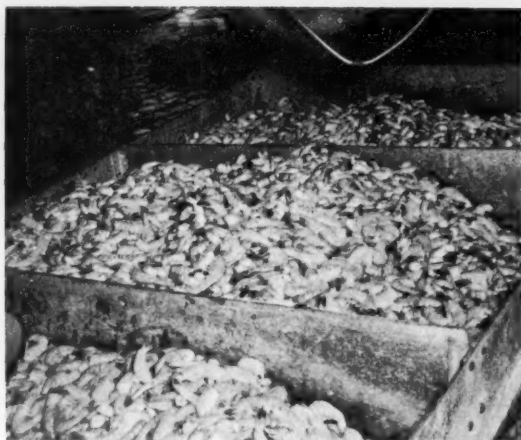
Prices this June were mostly lower in the drawn, dressed, or whole finfish subgroup and the index was down 1.1 percent

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			June 1964	May 1964	June 1964	May 1964	Apr. 1964	June 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					105.6	105.4	103.1	114.4
Fresh & Frozen Fishery Products:					107.8	107.4	103.7	120.5
Drawn, Dressed, or Whole Finfish:					106.3	107.5	98.4	109.7
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.08	75.2	60.5	67.4	97.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.36	.34	107.0	101.5	82.8	106.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.89	.92	124.7	127.8	116.3	118.8
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.43	.62	63.4	92.5	84.3	84.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.43	.58	69.6	94.2	69.6	76.2
Processed, Fresh (Fish & Shellfish):					114.8	117.2	115.0	135.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.32	.30	77.7	71.6	75.3	100.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.00	.99	117.2	116.0	111.3	133.0
Oysters, shucked, standards	Norfolk	gal.	7.00	7.50	118.0	126.5	126.5	143.3
Processed, Frozen (Fish & Shellfish):					98.7	94.7	94.7	113.1
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.37	92.5	92.5	93.8	100.1
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.35	.36	101.1	104.1	107.0	102.6
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	105.2	108.7	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.82	.75	96.6	88.3	86.6	118.6
Canned Fishery Products:					102.2	102.2	102.5	104.1
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	22.25	22.25	97.0	97.0	95.9	104.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.50	11.50	102.1	102.1	103.3	99.9
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.13	105.9	103.9	103.9	100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.81	8.86	113.0	113.7	116.5	113.0

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



Fresh East Coast shrimp on display at one of the stands in the New York City Fulton Fish Market.

from the previous month. Prices this June were sharply lower for Great Lakes fresh-water fish and fresh and frozen king salmon at New York City (down 2.4 percent from the previous month). But prices were higher for ex-vessel large haddock (up 24.3 percent) at Boston and fresh and frozen halibut (up 5.4 percent) at New York City. Compared with June 1963, prices in the subgroup this June were lower (by 3.1 percent) for all products, except salmon (up 5.0 percent) and halibut (up 0.6 percent). From June a year earlier, ex-vessel large

haddock prices were down 23.3 percent and Lake Superior whitefish prices were sharply lower by 24.8 percent this June.

The subgroup index for processed fresh fish and shellfish in June 1964 was down 2.0 percent from the previous month. From May to June prices were lower for shucked standard oysters (wholesale price down 50 cents a gallon) at Norfolk. The lower prices for oysters were offset by increases in prices for fresh haddock fillets (up 8.5 percent) at Boston and fresh shrimp (up 1.0 percent) at New York City. Compared with June 1963, the subgroup index this June was down 15.0 percent because prices for all items in the subgroup were down substantially.

In the subgroup for processed frozen fish and shellfish there were price changes only for frozen shrimp and haddock fillets with the index up 4.2 percent from the previous month. Prices for other items in the subgroup were unchanged from May to June. A stronger market for frozen shrimp at Chicago saw higher prices (up 9.4 percent) than in the previous month, but prices for haddock fillets were lower by 2.9 percent. As compared with June 1963, prices for all items in the subgroup were considerably lower this June and the index was down 12.7 percent.

The subgroup index for canned fishery products was unchanged from May to June because higher prices for California canned jack mackerel (up 1.9 percent) were offset by a slight drop in prices for canned Maine sardines (down 0.6 percent). Prices for canned pink salmon this June were the same as in May but were 7.3 percent lower than in June 1963. Stocks of canned pink salmon on June 1, 1964, were reported liberal and estimated to be several hundred thousand cases above normal for that date. Stocks of canned jack mackerel were below normal due to lower California landings of that species. Prices for canned Maine sardines were lowered by some distributors in anticipation of the new-season pack. The subgroup index this June was lower than for the same month a year earlier by 1.8 percent principally because of lower pink salmon prices.



NORTH AMERICAN CATFISH ARE SOLICITOUS PARENTS

Catfish are known to be careful parents. Many of them build nests and take care of their young after they hatch. Fresh-water catfish can sometimes be seen near the edge of lakes in early summer as one of the parents, usually the father, patiently swims near his brood of finger-sized, dark-colored offspring.

There are about two dozen kinds of catfish in the world. Our North American catfish belong to two families--the fresh-water (Ictaluridae) and the salt-water (Ariidae).

Many catfish males carry the eggs in their mouths, sometimes for a few months. After the eggs hatch, the male catfish carries on with his parental duty by following the tiny offspring, opening his mouth for them to flee inside at the first sign of danger.

They are called catfish because of the whiskers (barbels) around their head, and there are many superstitions about them, including the nickname, children of the devil.

Catfish have spines in the fins which can cut the hand of a careless angler. A gland near the base of the spine secretes a substance that increases the swelling and painfulness of the wound. (Science News Letter, June 20, 1964.)



FOREIGN

International

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-MARCH 1963-1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Production and exports of fish meal by FEO countries during January-March 1964 were up substantially from that same period of the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-March 1963-1964

Country	February		March		Jan.-Mar.	
	1964	1963	1964	1963	1964	1963
	..... (1,000 Metric Tons)					
Chile	13.9	1/	17.2	1/	42.9	1/
Angola	2/	2.8	2/	1.8	2/	7.4
Iceland	8.5	7.3	11.7	5.7	31.7	22.1
Norway	13.5	5.5	13.0	8.9	53.7	22.6
Peru	100.7	104.1	186.1	103.9	388.7	355.3
So. Africa (inc. S.W. Africa) ...	11.2	8.9	20.0	12.8	44.6	28.5
Total	147.8	128.6	248.0	133.1	561.6	435.9

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-March 1963-1964

Country	February		March		Jan.-Mar.	
	1964	1963	1964	1963	1964	1963
	..... (1,000 Metric Tons)					
Chile	21.3	1/	4.3	1/	47.4	1/
Angola	2/	2.9	2/	1.6	2/	7.2
Iceland	5.5	6.6	8.8	5.4	21.0	21.5
Norway	6.4	3.0	28.2	3.7	43.2	10.4
Peru	125.2	45.8	175.2	122.0	495.9	313.5
So. Africa (inc. S.W. Africa) ...	16.4	15.9	33.4	21.3	63.8	47.0
Total	175.8	74.2	249.9	154.0	671.3	399.6

1/ Data not available. Chile became a member of FEO at the end of 1963.

2/ Data not reported.

During the first quarter of 1964, Peru accounted for 69.2 percent of total fish-meal exports reported by FEO countries, followed by Norway with 9.6 percent, South Africa with 7.9 percent, Chile with 7.6 percent, and Iceland with 5.7 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, June 3, 1964.)

WORLD PRODUCTION:

March 1964: World fish meal production in March 1964 was substantially above that in the same month of the previous year, according to preliminary data from the International Association of Fish Meal Manufacturers. Compared with the previous month, production in March 1964 was up 38.8 percent due mainly to heavier output in Peru, Norway, and South Africa.

World Fish Meal Production by Countries, January-March 1963-1964

Country	March		Jan.-Mar.	
	1964	1963	1964	1963
	..... (Metric Tons)			
Canada	4,227	4,848	11,000	25,613
Denmark	3,810	5,499	15,017	18,611
France	1,100	1,100	3,300	3,300
German Federal Rep.	6,388	8,110	19,535	19,872
Netherlands	1/	100	1/	900
Spain	1/	3,400	1/	7,016
Sweden	527	324	2,012	1,207
United Kingdom	6,438	7,080	21,128	20,003
United States	2,723	2,420	6,053	7,075
Angola	1/	1,648	2/5,566	7,553
Iceland	8,771	5,441	21,028	21,470
Norway	28,221	3,664	43,238	10,370
Peru	175,170	122,030	495,937	313,537
So. Afr. (incl. S.W. Afr.)	34,188	21,459	65,437	48,089
Belgium	375	375	1,125	1,125
Chile	4,291	1/	47,409	1/
Morocco	1/	1/	1/	1/
Total	276,229	187,498	757,785	505,741

1/ Data not available.

2/ Data available only for January 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in the first 3 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 65 percent of world output during January-March 1964. There was also a noticeable increase in Norwegian and South African production in January-March 1964. The gain was offset partly by a sharp drop in Canadian output.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

February 1964: World fish meal production in February 1964 was substantially above that in the same month of the previous year, according to preliminary data from the International Association of Fish Meal Manufacturers. Compared with the previous month, production in February 1964 was down 29 percent due mainly to lower output in Peru.

International (Contd.):

World Fish Meal Production by Countries, January-February 1963-1964				
Country	February		Jan.-Feb.	
	1964	1963	1964	1963
	(Metric Tons)			
Canada	3,368	13,249	6,773	20,765
Denmark	2,408	6,994	11,207	13,112
France	1,100	1,100	2,200	2,200
German Federal Rep. .	6,390	5,787	13,147	11,762
Netherlands	1/	500	1/	800
Spain	1/	1,531	1/	3,616
Sweden	415	439	1,485	883
United Kingdom	6,954	6,480	14,690	12,923
United States	1,663	2,583	3,330	4,655
Angola	1/	2,949	2/5,566	5,905
Iceland	6,521	6,553	12,257	16,029
Norway	6,410	3,047	15,017	6,706
Peru	125,216	45,848	320,767	191,507
So. Afr. (incl. S.W. Afr.)	16,947	16,108	31,249	26,630
Belgium	375	375	750	750
Chile	21,270	1/	43,118	1/
Morocco	1/	1/	1/	1/
Total	199,037	113,543	481,556	318,243

1/Data not available.

2/Data available only for January 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in the first two months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 86 percent of world output during January-February 1964. There was also a noticeable increase in Norwegian and South African production in January-February 1964. The gain was offset partly by lower output in Canada, Denmark, the United States, and Iceland.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

SUPPLY INDICATORS FOR PRINCIPAL EXPORTING AND IMPORTING COUNTRIES, 1963:

The Fish Meal Exporters Organization (FEO) has estimated world fish meal production in 1963 at 2,800,000 metric tons (exclud-



Fish Meal Supply Indicators for Principal Exporting and Importing Countries, 1963

Principal Exporting Countries	Production	Exports	Domestic Consumption ^{1/}
	(Metric Tons)		
Peru	1,159,200	2/1,169,700	38,200
South Africa Republic	238,000	198,800	26,400
Norway	132,100	104,000	28,400
Chile	90,400	86,800	13,000
Iceland	87,190	99,000	4,100
Angola	31,400	30,000	600
Denmark	2/86,900	46,900	35,000
Canada	77,400	56,900	3/
Morocco	2/21,000	19,000	2,000
Total	1,923,590	1,811,100	147,700

Principal Importing Countries	Production	Imports	Total Production and Imports
	(Metric Tons)		
United States	219,200	347,200	566,400
Japan	350,000	90,000	440,000
West Germany	74,000	295,300	369,300
United Kingdom	75,100	281,500	356,600
Netherlands	7,000	175,600	182,600
Spain	25,000	81,000	106,000
France	13,000	76,500	89,500
Italy	1,500	61,200	62,700
Belgium	4,000	48,800	52,800
Sweden	6,600	29,900	36,500
Switzerland	-	21,100	21,100
Eastern European countries	3/	160,559	3/
Total	775,400	1,668,659	2,444,059

1/Estimated.

2/Revised.

3/Not available.

Note: There may be small discrepancies between data shown above and previously published fish meal production and foreign trade data for selected countries.

Source: Fish Meal Exporters Organization.

ing production data for Communist China and the Soviet Union which are unavailable). A large part of world production enters into foreign trade. The United States and the countries of Western Europe are the leading buyers.

FOOD AND AGRICULTURE ORGANIZATION

INTERNATIONAL SYMPOSIUM ON HOW TO KEEP FISH FRESH:

How to get fish to the consumer in the best possible condition was studied by some 100 scientists from 17 countries during a symposium held in Husum, West Germany, May 26-30, 1964. The Husum meeting, which was sponsored by the Food and Agriculture Organization (FAO), was a "Symposium on the Significance of Fundamental Research in the Utilization of Fish." It surveyed the existing scientific information in that field and drew up a list of priorities for further study. Those priorities will be passed on to fisheries research institutions around the world.

The Husum meeting marks the first time that those problems have been the subject of

International (Contd.):

a scientific meeting on a worldwide basis. About 45 papers and technical notes were presented.

The Symposium's work began with a review of the various factors affecting the quality of fish and was divided into four major areas: (1) reducing the high protein losses which occur in fish and fishery products between the fisherman's boat and the market; (2) surveying the quality tests for both fresh and frozen fish developed and carried out in various countries; (3) improving processing methods and developing new ones; and (4) providing more fish for human consumption by the development of new fishery products.

The Symposium was held under the auspices of the Government of the Federal Republic of Germany and the Nutrition Advisory Committee of the West German fisheries industry. (Food and Agriculture Organization Press Release, Rome, May 15, 1964.)

INTERNATIONAL PACIFIC HALIBUT COMMISSION

HALIBUT FISHING

RESTRICTIONS PROPOSED:

Halibut fishing in the catch-limit area of the Bering Sea is tentatively scheduled for closure in 1965, and further restrictions are being considered on North Pacific halibut fishing off the United States and Canadian coasts.

The announcement was made by the International Pacific Halibut Commission (IPHC) at the close of a special meeting of the Commission at Seattle, Wash., on June 4, 1964. The purpose of that meeting was to examine recent developments in the Pacific halibut fishery, and particularly those in the Eastern Bering Sea where there has been a serious decline in the fishery. The IPHC represents the United States and Canadian Governments in regulating halibut fishing in the North Pacific.

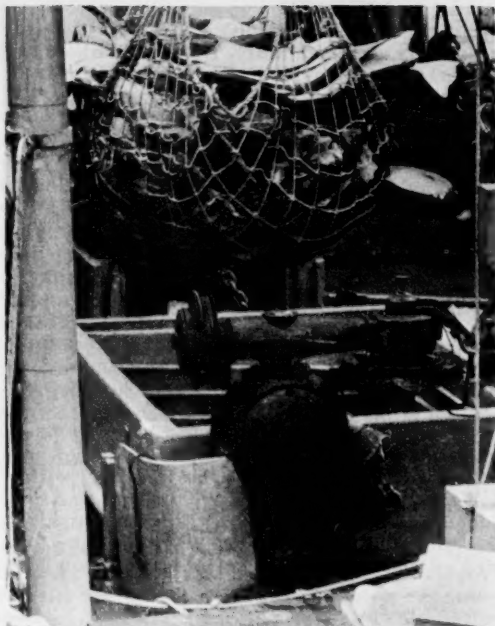
Closure of the Bering Sea to halibut fishing was predicted after it became apparent that the area there was fished out by the combined fishing fleets of the United States, Canada, and Japan.

Continued poor halibut fishing in Area 2, extending from Willapa Bay to Cape Spencer in Alaska, was relatively unexpected and has caused more concern over the state of the North Pacific halibut fishery.

With regard to halibut fishing in the Bering Sea, the Commission's Chairman, Harold E. Crowther, expressed deep concern and said, "Unless there is marked improvement in the halibut stocks, it will be necessary to recommend closure of the Bering catch-limit area in 1965.

"The Commission intends to keep the fishery in this area under careful review, and if conditions continue to deteriorate, more immediate action may be required.

"In view of conditions prevailing in other sections of the Pacific Coast, particularly in Area 2, close surveillance of the fishery will be maintained in the event further restrictions in these areas are required." In 1963, the combined fleets of the three nations failed to land the expanded limit. This year the halibut quota in the area in the Bering Sea designated as



Fresh halibut being unloaded with a cargo net from the hold of an halibut fishing vessel at Seattle, Wash.

Area 3B North Triangle was cut sharply, but fishermen found almost no halibut on those grounds.

In Area 2, the situation appears to be less desperate. Only the traditional United States and Canadian fleets have been allowed to fish in that area. However, fishermen failed to catch the full quota of 28 million pounds in Area 2 last year. This year, with the quota cut down to 25 million pounds, fishermen have continued to make a disappointing showing in that area which in the past has produced almost half the halibut harvest of the North Pacific.

At the June 4 special meeting, the Halibut Commission conferred with representatives of the fishermen, fishing vessel owners, and brokers and processors from Washington, British Columbia, and Alaska.

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

14TH ANNUAL MEETING HELD AT HAMBURG:

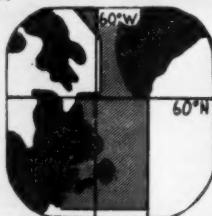
The 14th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF) was held at Hamburg, Germany, June 1-6, 1964. Member Countries attending the Annual Meeting were Canada, Denmark, France, Federal Republic



International (Contd.):

of Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, Soviet Union, United Kingdom, and the United States.

Various preliminary meetings were held starting on May 21. These were meetings of the (1) Ad Hoc Group on Pelagic Fishes; (2) Subcommittee on Fishery Assessment; (3) Standing Committee on Research and Statistics; and (4) Scientific Advisers to Panels on May 30, which was followed by the Annual Meeting on June 1.

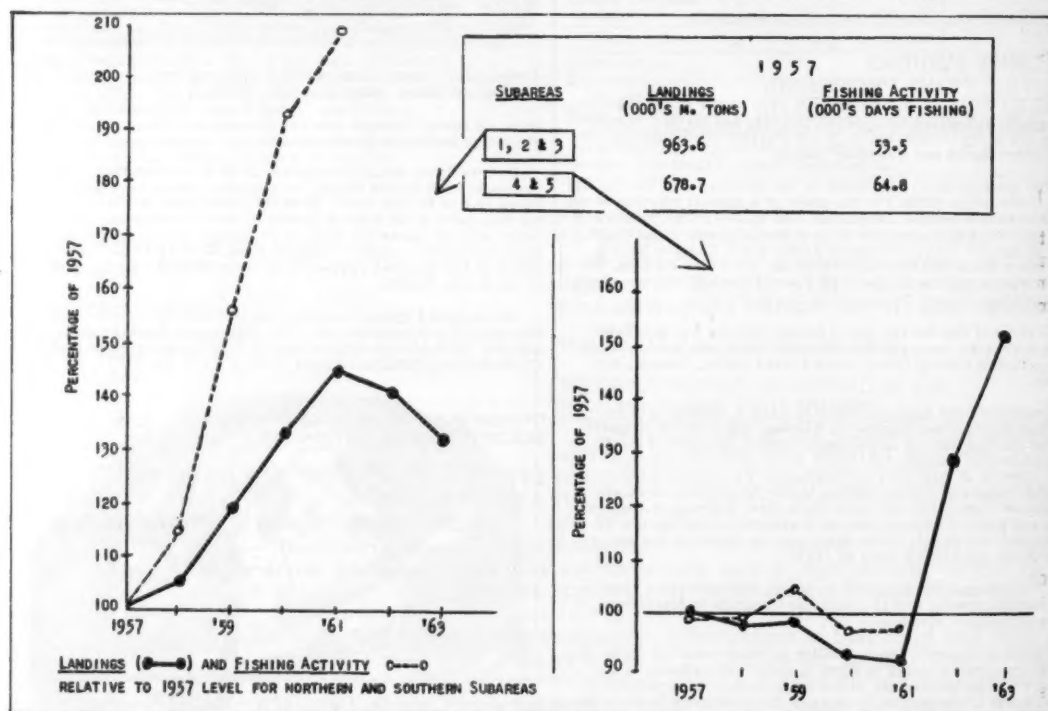


At the 1964 Annual Meeting, a report was given on the present status of the fisheries in which it was concluded that the intensity with which many of the major stocks of cod and haddock are now being fished is near that at which they can provide their greatest sustained catches. That report included an analy-

sis of recent trends and changes in the fishing activity and catches of fish which show that the increased fishing over the past six years in the Northwest Atlantic has not been matched, especially in the northern part of the Northwest Atlantic, by corresponding increases in the amount of fish landed. The report further showed that mesh-size regulations, while helping to keep up the total catches, could not offset the expected decrease in the ratio of "catch landed" to "fishing effort expended" if fishing continues to increase.

At the meeting, each of the 13 Member Countries reported its 1963 catch of fish from the Convention Area which extends from Greenland to Rhode Island. The total landings amounted to some 5.7 billion pounds, about the same as in 1962.

Although the 1963 catches of cod and ocean perch declined somewhat, the total from the Convention Area was maintained by the Soviet Union's large catch of whiting (silver hake). The U.S.S.R. reported taking 235 million pounds of that species from Georges Bank and



Trends and changes in Northwest Atlantic catches and fishing activity, 1957-63.

International (Contd.):

270 million pounds from the Sable Island area in 1963.

The total United States landings from the Convention Area dropped from 1.1 billion pounds in 1962 to 933 million pounds in 1963.

Canada traditionally has been the largest producer in the area and still is. Her catch amounted to 1.5 billion pounds in 1963 compared with 1.6 billion pounds in 1962.

The U.S.S.R., which started fishing in the Convention Area in 1958, rose from third place in 1962 to second place in 1963 in terms of quantity of fish taken from the Area.

Japan, which is not a member of the Commission, sent observers to the 14th Annual Meeting and reported that she now has four trawlers engaged in experimental fishing operations in the area. Other observers present were from the Food and Agriculture Organization (FAO), the Fisheries Laboratory, Aberdeen, Scotland, and from a private United States foundation.

In reviewing the report of its scientific committee on research and statistics, the Commission noted that the amount of fishing in the area has increased markedly during the past few years but that the total amount of fish taken is leveling off. The scientists reported that it is unlikely that further increases in fishing effort will result in greatly increased returns. For this reason the Commission asked its scientific committee to make a study of the feasibility of regulating fishing in the area by means other than mesh regulations.

The Commission already has under regulation the size of meshes used in trawl nets for some species of fish, but no action has been taken to regulate the amount of fishing in the area. The present regulations establishing the minimum size of mesh to be used in a fishing net were drafted for use in the Commission years ago when manila was the principal fiber used for making trawl nets. At the 1964 meeting, the regulations were changed and brought up-to-date to meet the growing and widespread use of synthetic fibers. In this matter the Commission took the advice of its scientists who had compiled and analyzed experimental evidence on the way that meshes of different sizes and ma-

terials select the different sizes of commercial fish available.

Progress was made in the matter of the international enforcement of Commission regulations. At present each country polices its own fishing fleet, but it has been considered desirable for some years now that some kind of international system be set up to assist in the enforcement of regulations. Although no such system was recommended at this meeting, the Commission encouraged countries to exchange management personnel on an invitation basis during the coming year so that countries could become familiar, first hand, with the kinds of problems faced by management personnel of other countries. Countries were requested to file with the Commission by January 1, 1965, reports on the enforcement systems used by their respective governments.

The increasing number of fishing boats active on both sides of the Atlantic is creating navigational hazards which are accentuated by the fact that the practices of different fleets are not the same. The Commission recommended that all countries accept an invitation to a conference which will likely be held soon to draft an agreement embodying a modern code for the conduct of fishing operations in the North Atlantic.

At the meeting, all Member Countries of ICNAF indicated their intention to take the necessary final step to enable the Commission to include in its functions matters on the conservation of the harp and hood seals.

United States Commissioners at the meeting included Frank P. Briggs, Assistant Secretary of the Interior for Fish and Wildlife, and a delegation of 11 advisers. Secretary Briggs was reelected as Vice Chairman of the Commission for the coming year. Ronald W. Green of Augusta, Me., was elected Chairman of the Committee on Finance and Administration.

The 15th Annual Meeting of ICNAF will be held in Halifax, Nova Scotia, Canada, on June 7, 1965.

Note: See *Commercial Fisheries Review*, July 1964 p. 42; August 1963 p. 75.

INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEANEW DRAFT CONVENTION TO BE
CONSIDERED AT ANNUAL MEETING:

A new draft convention for the International Council for the Exploration of the Sea (ICES)

International (Contd.):

will be considered at a meeting of representatives of Member Governments of that organization on September 7, 1964. The meeting is expected to be convened by Denmark's Foreign Ministry, with expectations that the new Convention would be signed by authorized Government representatives by the time the meeting ended. No non-member observers will be invited to the meeting.

The new Convention would clarify the international status of the ICES and its personnel, and make possible more adequate arrangements for suitable quarters than in Charlottenlund, located north of Copenhagen. Final ratification of the new Convention would be hoped for by that organization's October 1965 annual meeting.

Neither the ICES nor its personnel have had the usual international status of an organization of its type. With the acceptance of the new convention those problems would be corrected. It was conjectured that Denmark might provide new quarters or that the Member Governments of ICES might contribute jointly to a building. (United States Embassy, Copenhagen, April 29, 1964.)

INTERNATIONAL INDIAN OCEAN EXPEDITION

INDIA'S OCEANOGRAPHIC RESEARCH PROGRAM:

A meteorological vessel (NOMAD), which will function as an automatic weather station, was launched in the Bay of Bengal during April 1964. The vessel was made available to India's Meteorological Department by the National Science Foundation to provide meteorological data for the Indian program of the International Indian Ocean Expedition (IIOE).

India proposes to undertake intensive oceanographic investigations on the Continental Shelf and superjacent waters along her coasts including northern parts of the Arabian Sea, northern Indian Ocean and parts of the Bay of Bengal with the help of her four research vessels. Two of the research vessels, the INS Kistna and R.V. Varuna, have already made extensive physical oceanographic observations with special reference to temperature, salinity, and oxygen in those areas.

Other programs envisaged during the IIOE include: (1) direct observational study of the properties of oceans; (2) exploration of areas

of potential fisheries; (3) detailed study of the atmospheric circulation of the monsoon region; and (4) studies of the bottom topography and temperature structure of the ocean. The various programs of study will help in exploitation of the ocean's productivity, improvement of weather forecasting services, and better understanding of the monsoon cycle.

India's IIOE program of marine biology and fisheries will be mainly directed to exploring areas of high productivity and potential fisheries which could be developed and exploited. Apart from plankton collections and measurement of primary productivity, experimental fishing using different types of gear will also be undertaken. Some of the problems suggested for Indian work are: (1) studies of phyto- and zooplankton and benthos; (2) the distribution of dissolved oxygen and its relation to biological productivity of waters; (3) critical studies of the euphotic zone in relation to variations; and (4) special biological, physiological and life history studies on selected groups including various oceanic animals and birds. (United States Embassy, New Delhi, May 18, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 23; January 1964 p. 26.

INTERNATIONAL WHALING COMMISSION

16TH ANNUAL MEETING HELD:

The 16th annual meeting of the International Whaling Commission was held in Sandefjord, Norway, June 15-26, 1964. At the meeting, the Commission's Scientific Committee was to discuss implementation of the agreement to station international observers in the Antarctic during the annual whaling season.

NORTHEAST ATLANTIC FISHERIES COMMISSION

SECOND MEETING HELD AT THE HAGUE:

The Northeast Atlantic Fisheries Commission (NEAFC) held its second meeting at the Hague, May 12-15, 1964, with delegations present from all member countries which include Belgium, Denmark, Federal Republic of Germany, France, Iceland, Ireland, The Netherlands, Norway, Poland, Portugal, Spain, Sweden, the United Kingdom, and the Soviet Union. Observers were present from the United States, the International Council for the Exploration of the Sea (ICES), and the International Commission for the Northwest Atlantic Fisheries (ICNAF).

At the meeting in The Hague, the Northeast Commission agreed on the following:

International (Contd.):

(1) A codification of the conservation measures inherited from the Permanent Commission under Article 16 of the 1959 Convention of the Northeast Atlantic Fisheries was approved.

(2) Minimum mesh sizes of nets applicable in the northern part of the 1946 (predecessor) Convention area should apply to the 1959 Convention area between 42° and 44° W. and between 32° and 51° E. For the present, no minimum sizes of mesh of nets were specified for the 1959 Convention area south of 48° north.

(3) The United Kingdom replaced the Federal Republic of Germany on Regional Committee 3, in accordance with their wishes.

(4) Permission to use top-side chafers was extended to January 1966. The ICES was requested to arrange for a detailed assessment of the various types of chafers in use in the Convention area and their effect on selectivity. Member Governments were asked to supply the Commission with additional information on types of chafers in use in their fishing industries and the effect on selectivity of nets. In particular, they were asked to explain any objections they may have to the top-side chafer specified by the Commission and the top-side chafer of the multiple-flap type.

(5) The ICES was requested to renew the activity of the Arctic Fisheries Working Group for a further study and reassessment of Arctic stocks.

(6) The ICES was requested to review the information available on the state of the stocks of the spiny dogfish and to advise the Commission on the effects of possible conservation measures.

(7) The ICES was requested to continue its study of the state of herring stocks in the Convention area.

(8) The provisions of Article 16 of the 1959 Convention which permit small fishing craft (primarily Danish) to fish for whiting in the Skagerrak and Kattegat Seas with small-mesh nets were extended until January 1, 1970.

(9) A Special Committee was established to study the practical problems involved in the establishment of international measures of

control on the high seas for the purpose of ensuring application of the Convention and the measures in force thereunder, as provided for in Article 13. Member Countries were asked to supply the Commission with a current account of their methods of national control. The Special Committee should be convened, if convenient, at the time and place of the Technical Conference on Policing to be called by the United Kingdom, possibly in the fall of 1964.

(10) The provisional budget for the year ending June 30, 1965 should be £3,730 (\$10,444).

(11) The next NEAFC meeting will be held in Moscow on May 11, 1965. (United States Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 20, 1964.)

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

JAPAN JOINS OECD:

On April 28, 1964, Japan became the 21st member of the Organization for Economic Cooperation and Development (OECD). Japan deposited ratification documents for the treaty between Japan and the OECD with the French Government, the custodian of such documents for OECD members. The action followed the Japanese House of Councillors' approval of the OECD codes and resolutions, and the treaty admitting Japan.



The Japanese Foreign Minister said that Japan should be able to solve its pending economic problems effectively through bilateral negotiations and through multilateral organizations such as the OECD, the General Agreement on Tariffs and Trade (GATT), the United Nations, and the International Monetary Fund (IMF).

The Japanese Minister of International Trade and Industry stated that he intends to make efforts to eliminate trade discriminations against Japan by taking advantage of Japan's official entry into the OECD, and that his ministry would strive to strengthen the nation's industrial foundation so that Japan may withdraw various reservations it has made in connection with its trade liberalization duties. (Japan Report, May 15, 1964.)

Note: See *Commercial Fisheries Review*, October 1963 p. 43.



Argentina

FISH MEAL AND OIL PRODUCTION AND EXPORTS, 1962-1963:

Production of fish meal from salt-water fish has expanded rapidly in Argentina during the last 2 years and the industry now has an annual capacity of about 12,000 tons of fish meal. Fish oil production in Argentina also increased in 1963.



Argentina's Production and Exports of Fish Meal and Oil, 1962-1963		
	1/1963	1962
	... (Metric Tons) ...	
Production:		
Fish meal:		
Salt-water	6,636.4	3,248.0
Fresh-water	1,418.9	1,273.0
Fish oil:		
Fish-body oil	1,135.9	718.5
Shark-liver oil	63.1	0.7
Exports:		
Fish oil	472.1	383.3
Fish meal	3,211.1	1,584.4
1/Preliminary.		

Exports of industrial products expanded along with production in 1963, with West Germany being the principal market for Argentine fish meal and most of the fish oil going to the Netherlands. (United States Embassy, Buenos Aires, May 14, 1964.)

Note: See *Commercial Fisheries Review*, Dec. 1963 p. 54.



Australia

MODIFIED TUNA LONG-LINING IN SHORE WATERS:

Encouraged by the record bluefin tuna season on the southern New South Wales fishing

grounds, a number of Australian fishermen are turning to modified inshore long-lining to catch yellowfin tuna which normally are available after the bait-and-pole fishing season for bluefin tuna ends in January. The modified long-line

method has been used successfully to catch yellowfin tuna in eastern Australian inshore waters for the past two seasons. It differs from the Japanese method of long-lining for bluefin tuna in the Tasman Sea in that the long line is used in much shallower water, the branch lines

are at closer intervals, and the main line is shorter. Buoys generally are spaced every three hooks. Branch lines are 2 or 3 fathoms long. Various types of wire trace are used. A few fishermen are using synthetic main lines but those are costly and most continue to use sisal and manila main lines. Synthetic fibers are often used in the branch lines.

Winching gear has been improved considerably since 1963 and most vessels are equipped with efficient horizontal disc-type haulers. The Japanese-type vertical hauler has not yet been introduced in the Australian inshore long-line fishery.

The yellowfin tuna season off New South Wales began in late January 1964. By early March 1964, a total of 200,000 pounds of yellowfin had been taken off southern New South Wales between Ulladulla and Bermagui by vessels operating troll and modified long-line gear. One fisherman operating out of the port of Ulladulla took 4,000 pounds of tuna in 1 day with a long line baited with 200 hooks. Fishermen operating in the Bermagui area with trolling and long-line gear were taking tuna ranging in size from 50 to 80 pounds. The heavier tuna were usually taken on long lines. The yellowfin tuna season off New South Wales



Australia (Contd.):

usually lasts until June. (Australian Fisheries Newsletter, April 1964.)

Note: See Commercial Fisheries Review, June 1964 p. 36, April 1964 p. 50.

**British Guiana****SHRIMP INDUSTRY TRENDS, 1963, AND OUTLOOK FOR 1964:**

In British Guiana, the shrimp catch in 1963 was estimated at about 5 million pounds, about the same as in 1962 and considerably above the 4 million pounds caught in 1961. Most of the shrimp catch is exported frozen to the United States.

In early 1964, shrimp vessels operating out of Georgetown, British Guiana, totaled 84 as compared to about 60 in 1962.

A United States firm which operates a number of shrimp vessels in British Guiana plans to expand its freezing capacity during 1964. Observers expect a considerable expansion in the British Guiana shrimp industry, as it is reported to have attracted the interest of a number of United States firms.

Except for shrimp, fishing in British Guiana remains a small enterprise serving the local market. (United States Consul, Georgetown, May 31, 1964.)

**Canada****NEW TUNA CANNERY PLANNED FOR NOVA SCOTIA:**

A new tuna cannery at a cost of \$1.25 million is to be built in Nova Scotia by a British Columbia fishing firm within the next two years. The plant will process both the Pacific and Atlantic tuna catches of a new tuna seiner, the Golden Scarab, which will cost \$1.5 million to build.

The Golden Scarab (168 feet long) is now being built at Luaza, Province of Quebec, and is expected to be completed by November 1964. A second tuna vessel (with 800-ton capacity) will be built and when both vessels are completed, their combined tuna catch will be

handled by the proposed cannery in Nova Scotia. The actual site of the plant has not yet been decided but Dartmouth, Yarmouth, or Liverpool were being considered.

Both of the new tuna seiners will have a long-range capability and will be able to stay out at sea for as long as 100 days. It is planned that they will make a minimum of 4 trips a year, 2 trips to the traditional Pacific tuna fishing grounds off Peru and 2 trips to the warmer waters of the Atlantic Ocean. (National Fisherman, June 1964.)

CHINOOK AND SILVER SALMON TAGGING PROGRAM IN BRITISH COLUMBIA:

A third tagging program designed by the Canadian Department of Fisheries to study the movements and exploitation of British Columbia chinook and silver salmon stocks in the Strait of Georgia area began in late May 1964. A tagging program in the same area conducted during May and June 1963 emphasized the tagging of silver salmon during the "blueback" stage. The results were very successful due in large part to the excellent cooperation of sport and commercial fishermen in returning tags. A second program conducted during December 1963 and January 1964 emphasized the tagging of mature silver salmon, and although tag returns are not yet complete, early indications show promise of an equally successful program.

Chinook salmon are the main objective of the third tagging program and the success of the program will again depend upon the cooperation of fishermen in returning tags with information on the date, method, and location of recovery. A nominal reward of C\$0.50 is offered by the Canadian Department of Fisheries for the return of each tag. (Canadian Department of Fisheries, Vancouver, May 25, 1964.)

SALMON TAGGING ON ATLANTIC COAST:

An extensive program involving the tagging and release of 150,000 Atlantic salmon smolts annually over the next few years was announced in June 1964 by the Canadian Fisheries Minister. The salmon will be reared at fish culture stations of the federal Department of Fisheries in New Brunswick until they are two years old when, as smolts, they will be tagged and released at various points in the Saint John and Miramichi River systems.

Canada (Contd.):

The purpose of the experiment in fish culture is: (1) to determine more accurately the fate of hatchery-reared salmon after they are released; (2) to find out whether early-run salmon spawn early-run progeny and late-run salmon, late-run progeny; and (3) to provide information on the usefulness of grilse salmon in spawning and propagation. The project will be carried out jointly by the Federal Fish Culture Development Branch and the Fisheries Research Board of Canada.

The Fish Culture Development Branch will carry out its share of the joint program on the Saint John River system. It will involve the rearing, tagging, and release of 50,000 two-year-old smolts from two-sea-year or older early-run salmon.

The Research Board's program on the Miramichi System involves both early-run and late-run salmon. Hatcheries will produce 25,000 early-run and 25,000 late-run two-year-old salmon smolts from maiden two-sea-year parents, and 25,000 early-run and 25,000 late-run two-year-old salmon smolts from grilse parents. The early-run parent salmon are to be taken prior to July 31, and the late-run fish after September 15. (Canadian Department of Fisheries, Ottawa, June 9, 1964.)

MARINE OIL PRODUCTION, UTILIZATION, AND FOREIGN TRADE, 1961-1963:

Production: Canadian production of marine oil showed a substantial gain in 1963 due mainly to greater herring oil output in British Columbia which accounted for 82.2 per cent of total production.

Table 1 - Canadian Production of Marine Oils, 1961-1963 and 1956-1960 Average

	1/1963	2/1962	1961	5-Year Avg. 1956-1960
Atlantic production ^{3/}	.....(1,000 Pounds).....			
British Columbia production (herring oil) ^{4/}	11,494	10,792	10,650	13,146
Total	53,171	41,031	42,863	29,552
	64,665	51,823	53,513	42,698

1/Preliminary.
2/Revised.
3/Consists mainly of fish oil and fish-liver oil from groundfish species and seal oil.
4/Consists entirely of herring oil.
Note: Production data converted to pounds using the factor 9,3073 pounds equal 1 imperial gallon.

Use in Margarine and Shortening: The domestic margarine industry has become an important user of marine oils. In 1963, marine oil replaced soybean oil as the leading constituent in Canadian margarine. In July and August 1963, marine oils accounted for over 50 percent of the total oils and fats (veg-

Table 2 - Canada's Use of Marine Oils^{1/} in Margarine and Shortening Production, 1961-1963 and 1956-1960 Average

Item	Unit	2/1963	3/1962	1961	5-Year Avg.
Marine Oils Used in Margarine Production:					
Quantity of marine oils used	1,000 lbs.	64.6	48.3	31.6	15.8
Percentage of total oils used	Percentage	46.7	31.7	21.3	13.5
Marine Oils Used in Shortening Production:					
Quantity of marine oils used	1,000 lbs.	22.9	21.6	16.9	15.5
Percentage of total oils used	Percentage	12.4	11.9	10.1	9.6

1/Refined-oil basis.

2/Preliminary.

3/Revised.

Table 3 - Canadian Imports of Marine Oils by Country of Origin, 1961-1963

Commodity and Country of Origin	1/1963	2/1962	2/1961
... (1,000 Pounds) ...			
Cod-Liver Oil:			
United Kingdom	526	757	917
Norway	37	30	48
South Africa Republic	297	-	-
Japan	168	84	5
United States	4	22	12
Other countries	7	-	-
Total cod-liver oil	1,039	893	982
Other Fish Oils:			
Iceland	11,864	30,060	12,711
Bahama Islands	-	-	948
United States	12,183	11,865	17,649
Other countries	118	196	79
Total other fish oils	24,165	42,124	31,387
Whale and Sperm Oil:			
United Kingdom	88	172	350
Norway	210	133	96
United States	350	582	693
Total whale and sperm oil	648	887	1,139
Fish Oil, Concentrated:			
United States	7	14	68
Other countries	-	-	2
Total fish oil, concentrated	7	14	70
Fish Oil for Fortifying:			
South Africa Republic	83	-	-
Japan	83	250	19
United States	3	22	15
Other countries	-	1	1
Total fish oil for fortifying	169	273	35
Total marine oil imports	26,028	44,191	33,613

1/Preliminary.
2/Revised.

Canada (Contd.):

etable, marine, and animal) used in Canadian margarine. But the use of marine oil in Canadian margarine declined to 38 percent of the total in December 1963 as rising prices reduced the advantage of herring oil over vegetable oil. The prices of British Columbia herring oil delivered at Toronto, Canada, in 1963 were (in Canadian cents per pound): February 8.2; April 8.5; June 9.4; August 10.2; October 10.6; and December 10.7.

Foreign Trade: Canadian imports of marine oils were down sharply in 1963 due mainly to smaller shipments of fish oil from Iceland, which in recent years has joined the United States as a leading supplier of marine oils to Canada. Shipments of fish oil from the United States in 1963 were up slightly from the previous year, but down 31.0 percent from those in 1961.

Canadian exports of marine oils in 1963 were more than double those in the previous year, although the major foreign markets for herring oil have not been recovered. (Canadian herring oil exports dropped from over 23 million pounds in 1960 to less than 1 million pounds in 1961.) The gain in exports in 1963 was due mainly to larger shipments of

cod-liver oil to the United States, and greater exports of whale oil to the United Kingdom, Italy, and the Netherlands. Exports of herring oil to the United Kingdom were also up in 1963. (United States Embassy, Ottawa, April 16, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 65, January 1963 p. 80.

* * * * *

CHANGES ANNOUNCED IN FISHING VESSEL ASSISTANCE REGULATIONS:

Changes in the Fishing Vessel Assistance Regulations, which were announced on June 5, 1964, by Canada's Fisheries Minister, give greater encouragement to fishermen in the five Atlantic Seaboard Provinces to acquire more modern and efficient fishing craft. This, the Minister said, is a further step in the development program discussed at the Federal-Provincial conference on fisheries this past January.

The minimum size of vessels eligible for assistance has been lowered to 35 feet overall length, from the previous minimum of 45 feet. The maximum size of 99.9 gross tons is unchanged. Formerly, the rate of assistance was C\$250 a gross ton. That rate has been replaced by two new rates: (a) 25 percent of the cost, approved by the Fisheries Minister, of vessels 35 to 54.9 feet in length overall and, (b) 30 percent of the cost (also approved) of vessels from 55 feet in length overall up to the maximum of 99.9 gross tons. The approved cost will be based on the total cost of each vessel equipped and ready for fishing.

During the first few years of operations under the new regulations, assistance to vessels under 45 feet in length will be limited to approved experimental designs. The Fishermen's Loan Boards in the Provinces of New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland and the Minister of Industry and Commerce in the Province of Quebec will continue the direct administration of the new regulations. Close control over the design and specifications of craft eligible for assistance will be maintained by Federal-Provincial cooperation. This will include consideration of the number of craft to be built each year, their location, and the co-ordination of their construction with training projects designed to provide skilled manpower for a modern Atlantic fleet.

The new assistance rates apply to all applications filed by fishermen with Provincial

Table 4 - Canadian Exports of Marine Oils by Country of Destination, 1961-1963

Commodity and Country of Destination	1/1963	2/1962	2/1961
... (1,000 Pounds) ...			
Cod-Liver Oil:			
United Kingdom	1,330	1,288	1,338
United States	9,136	4,900	5,883
Other countries	-	-	3
Total cod-liver oil . . .	10,466	6,188	7,224
Other Fish-Liver Oils:			
Total all countries	12	34	12
Herring Oil:			
United Kingdom	911	-	515
United States	36	88	444
Total herring oil	947	88	959
Whale Oil:			
United Kingdom	1,726	593	-
Italy	2,228	-	-
Netherlands	896	-	-
El Salvador	-	661	-
United States	60	-	128
Other countries	8	5	-
Total whale oil	4,918	1,260	128
Other Marine Oils:			
United States	1,302	126	519
Other countries	-	20	5
Total other marine oils . .	1,302	146	524
Total marine oil exports . .	17,645	7,716	8,847

1/Preliminary.
2/Revised.

Canada (Contd.):

Loan Boards, and in Quebec with the Minister of Industry and Commerce, after June 30, 1964. (Canadian Department of Fisheries, Ottawa, June 5, 1964.)

NEW RESEARCH STATION ON LAKE HURON:

The Great Lakes Institute of the University of Toronto is establishing a permanent research station on the shore of Lake Huron about 10 miles south of Port Elgin, Ontario. The site is near the nuclear power plant being built at Douglas Point, and two major projects of the new research station are related to the new power facility. All types of fauna in Lake Huron are being examined and rated for natural radioactivity so that comparative tests can be made after the power plant is in operation in 1965 to determine if the natural radioactive level has been altered.

Other studies concern water and wind movements in Lake Huron, including surface and internal wave action and dispersal.

Four instrumented observation towers are being installed at the research station to permit the study of lake conditions to depths exceeding 60 feet. The Great Lakes Institute research vessel Porte Dauphine will carry on offshore studies in the area for part of the summer. (Great Lakes News Letter, Great Lakes Commission, March-April 1964.)

NEW OCEANOGRAPHIC RESEARCH VESSEL COMMISSIONED:

Canada's new \$7 million oceanographic research vessel, the Hudson, was commissioned in February 1964 at Halifax, Nova Scotia. She will be attached to the fleet of the Department of Mines and Technical Surveys at the Bedford Institute of Oceanography at Dartmouth, N.S. Oceanographers on the staff of the Fisheries Research Board of Canada, which has carried out a program of oceanography for many years, will take part in some of the investigations made possible by the addition of this vessel to Canada's scientific research fleet.

One of the most modern oceanographic research vessels afloat, the 294-foot Hudson, of 4,800 tons displacement, has been under construction since early in 1961, and was

overdue for more than a year. Much of the delay was caused by the problems involved in building a ship of such complexity. The vessel was built by a shipyard at Saint John, New Brunswick, in Canada.

The Hudson has a cruising range of 15,000 nautical miles and a speed of over 17 knots. The vessel is considered a complete floating laboratory and is capable of hydrographic and oceanographic work anywhere in the world, but will serve mainly in the Arctic and Atlantic Oceans. Her schedule is already fully booked for 1964, the main tour of duty being a full-scale geophysical investigation of Hudson Bay during July, August, and September. Before heading north in July, she was scheduled to work off the "tail" of the Grand Banks southeast of Nova Scotia during March and April of this year to obtain information for the production of charts useful to fishermen. (Trade News, February 1964.)

TEN SCHOLARSHIP AWARDS IN FISHERIES FIELDS:

Ten scholarships, valued at \$2,400 each, have been awarded for the 1964/65 academic year by the Fisheries Research Board of Canada. The scholarships were awarded through competition based on scholastic ability to graduate students carrying out research in fields pertinent to fisheries, including biology, zoology, and oceanography. Eight of the ten awards for 1964/65 are renewals, to students who won similar awards last year.

The graduate students will work on their research at four Canadian centers: the University of British Columbia, Vancouver; Dalhousie University, Halifax; the University of Western Ontario, London; and Carleton University, Ottawa. (Fisheries Council of Canada Bulletin, May 1964.)



Chile

TUNA INDUSTRY EXPANDING:

The Chilean tuna fishing industry is undergoing a revival after a period of relative inactivity. In the spring of 1964, at least 4 vessels based in Chile were known to be fishing for tuna. One of the 3 companies now active in the Chilean tuna fishery has placed orders which should expand its tuna fleet to 10 vessels. In addition, many other vessels in the anchoveta fishery off Chile could be converted to tuna fishing.

The tuna industry of Chile is located at the port of Iquique, in the Province of Tarapaca. In the mid-1950's, the industry

Chile (Contd.):

worked with an annual catch of 1,000 to 1,500 metric tons of tuna and 2,000 to 8,000 tons of bonito. That period corresponds to the years in which 5 purse-seine vessels of a United States tuna company were working with a Chilean company. Although the 5 purse seiners were left behind when the United States company withdrew from Chile in 1958, tuna fishing in Chile dropped off sharply in the late 1950's when Chile's fish reduction industry shifted to the north.



The new interest of the northern fishing industry was anchoveta. During the period 1959-1962, few vessels went out for tuna because lucrative anchoveta catches were possible within a day's fishing no more than 5 miles off the shoreline.

As part of its program for development of the fisheries of northern Chile, the Corporación de Fomento de Producción (CORFO) organized a new company to establish and operate at Iquique an integrated fisheries enterprise with a cannery, freezing and cold-storage facilities, and a fish meal plant. Plans called for the new company's fish meal plant to open May 28, 1964, and freezing and canning facilities should be in operation by the latter part of 1964. The new company acquired the *Santa Rosa* as the first vessel of its tuna fleet in late 1962.



Fig. 1 - Small local boats also fish tuna. Fishermen's children wade into surf at Quintay and help beach boats with catches of tuna.

The *Santa Rosa*, a 170-ton purse-seine vessel equipped with a brine tank, started fishing in January 1963. Its catch was processed (predominantly for export as whole frozen fish) by the company which had formerly worked with the United States tuna vessels. Yellowfin and possibly some albacore tuna were shipped to California, skipjack and bonito to Puerto Rico, and bonito to Europe.

Chilean tuna landings in 1964 should be substantially above those in 1963. In addition to the *Santa Rosa*, the new company organized by CORFO has purchased 2 new 380-ton vessels (originally built in England for Ghana), which ar-

rived in Chile and began in fishing for tuna in June 1964. The new Chilean company is also having 7 tuna vessels built in a German shipyard.

Two other fishing companies in Chile have also shown an interest in the tuna fishery. One of those companies has re-equipped for tuna fishing at least one of the purse-seiners left in Chile by the U. S. tuna company which withdrew in 1958. The other company (jointly owned by South African and Chilean interests) has diverted a new 170-ton purse seiner to tuna fishing.



Fig. 2 - Fishermen bring their catch of tuna ashore from small boats at Quintay.

The expansion of tuna fishing off northern Chile will vary with the availability of anchoveta to the northern fishing fleet. Another prolonged absence of anchoveta off the northern coast, as occurred in 1963 and again in early 1964, will send many of the 170-ton anchoveta purse-seine vessels out for tuna. It might also lead to the installation of freezing and canning facilities by a number of fishing companies now operating fish meal plants in the area. Some of those compa-

Table 1 - Chilean Landings of Tuna, Bonito, and Swordfish, 1950-1963

Year	Species			
	Atun	Cachurreta	Bonito	Pez-Espada
	.....(Metric Tons).....			
1963	70	57	2,553	94
1962	202	26	2,228	297
1961	21	99	3,586	394
1960	68	-	2,313	456
1959	22	-	2,566	555
1958	172	-	3,823	392
1957	487	39	2,144	357
1956	1,045	240	4,136	386
1955	929	401	7,500	237
1954	831	-	4,405	334
1953	1,116	-	1,974	416
1952	774	-	4,886	570
1951	570	-	3,973	870
1950	412	-	2,927	786

Note: "Atun" generally refers to yellowfin and albacore tuna. "Cachurreta" is skipjack. "Pez-Espada" is the swordfish which is more generally known by the name "albacore." As both albacore tuna and swordfish are captured off Valparaíso, there may have been some confusion in the landing reports on which the statistical data are based.

Chile (Contd.):

Table 2 - Chilean Landings of Tuna, Bonito, and Skipjack by Months, 1963			
Months	Atun/ (Yellowfin-Albacore)	Bonito	Cachurreta (Skipjack)
	(Metric Tons)		
January ..	1.6	164.3	-
February ..	23.8	181.0	19.0
March	37.6	19.5	36.6
April	-	131.2	-
May	4.7	136.8	-
June	0.8	138.8	-
July	0.5	116.9	-
August ..	0.2	99.9	-
September ..	-	437.9	-
October ..	0.3	491.4	0.7
November ..	0.5	408.7	0.4
December ..	-	226.7	0.7
Totals ..	70.0	2,553.1	57.4

1/Mostly of not all yellowfin.

nies have substantial foreign capital backing. In the past, only one company in northern Chile had freezing and canning facilities capable of handling tuna for export. But by the end of 1964, the new company organized by CORFO will have a modern automatic tuna canning line and blast-and brine-freezing equipment in operation. Those facilities will create a market for tuna that has not existed in north Chile since the withdrawal of the United States tuna firm in 1958.

Yellowfin tuna is taken from 5 to 35 miles off the northern coast of Chile. February through April is the best yellowfin tuna season, according to the captain of the *Santa Rosa*. Official statistical data indicate that 86 percent of the 1963 Chilean catch of yellowfin tuna was taken in February and March. The bonito catch was spread more evenly over the year in 1963. More intensive fishing might change the picture. For the present and near future, the northern fleet is expected to give preference to anchoveta fishing and turn to tuna in the slack season (normally mid-June to October).

The current vessel preference of anchoveta fishermen in Chile is the 170- to 180-ton purse seiner. Such vessels are capable of fishing for tuna, particularly yellowfin. (United States Embassy, Santiago, May 18, 1964.)



Costa Rica

FISH AND SHELLFISH LANDINGS, 1963/64 SEASON:

Landings of fish and shellfish in Costa Rica during the 1963/64 season amounted to 2,288 metric tons--down 5 percent from the previous year. Leading species were shrimp (all varieties) which accounted for 48 percent of the total landings, followed by tuna, and unclassified finfish.

Landings of all species of shrimp were up 17 percent from the previous season and were larger than those for each season since 1959/60 when they were only about one-half the 1963/64 landings. Landings of large white shrimp, however, have declined steadily each season while those for small shrimp increased.

The 1963/64 landings of small white shrimp were at a five-year high and well above the yearly average for the five years under study. Although landings of pink shrimp were 16 percent lower than the previous season, they were well above the yearly average for the five-year period.

Tuna landings during the 1963/64 season were down 23 percent from the previous year. Most of the tuna landed in Costa Rica is purchased by the tuna cannery there from United States fishing vessels.

Costa Rica Landings of Fish and Shellfish, 1963/64 Fishing Season with Comparisons					
Species	1963/64	1962/63	1961/62	1960/61	1959/60
	(Metric Tons)				
Fish (Unclass.)	543	659	685	697	695
Shrimp:					
Large white	305	274	385	459	500
Small white	618	557	549	511	121
Pink	170	202	64	107	-
Tuna	519	675	554	426	551
Turtle, green	45	23	33	12	21
Spiny lobster	88	27	94	1,420	134
Total ..	2,288	2,417	2,364	3,632	2,022

Source: Ministry of Agriculture and Livestock, Fish and Wildlife Section.

Finfish (unclassified) landings were lower in 1963/64, due in part to the low prices offered by the Consejo Nacional de Produccion (National Production Council) which caused fishermen to lose interest in that fishery.

The quantity of spiny lobsters landed in 1963/64 was very small although it was three times greater than the 27 metric tons of the previous season, but down substantially as compared with the 1,420 tons of the 1960/61 season. An issue during the 1963/64 season was the matter of bait for lobster traps. Lobster fishermen on the Atlantic Coast were handicapped because they had to buy substantial quantities of bait from suppliers in Puntarenas on the Pacific Coast at an average price of CR\$0.75 (11 U.S. cents) a pound. Most of the bait purchased there consisted of trash fish which Pacific Coast shrimp fishermen generally discard. Lobster fishermen on the Atlantic Coast of Costa Rica continue to press the Government for suitable regulations which will protect their interests. (United States Embassy, San Jose, May 15, 1964.)



Denmark

AUTHORITY SOUGHT FOR RATIFICATION OF WESTERN EUROPEAN FISHERIES CONVENTION AND NEW FISHING LIMITS:

On May 20, 1964, Denmark's Foreign Minister requested ratification by the Danish Parliament of the Fisheries Convention approved March 9, 1964, at the Western European Fisheries Conference in London. The Foreign Minister's proposal pointed out that Denmark will be able to extend its fishing limits in the Kattegat, Skagerrak, and North Sea without affecting the present 12-mile limits in Greenland and the Faroe Islands. It was considered that if Greenland and the Faroe Islands had been included in the Convention area--and for Norway and Iceland to have accepted the Convention--would have been a backward step from their 12-mile limits.

On the same date, the Fisheries Minister also submitted brief legislation relating to Danish fishing limits. The first of that legislation authorizes the Fisheries Minister to establish regulations governing Danish fisheries limits in accordance with the provisions of the London Fisheries Convention of March 9, 1964. The second paragraph states that the legislation does not apply to the Faroe Islands or to Greenland.

Authority to extend Denmark's fishing limits was being sought, according to the Fisheries Minister, because it is in the interest of the fishing industry and the public to do so at the earliest possible time rather than delay until the next session of the Parliament. The authority granted will not be exercised until after discussions with the Parliament and the fishing industry. Also, there are transitional periods before the fully extended limits become effective.

The Fisheries Minister foresees better fishing for Danish inshore fishermen when the limits are extended and better conservation of the fishery resources within the established limits. Since Ireland and the United Kingdom have mentioned a transitional period of 1½ years for countries with historic fishing rights before extending the limits from 3 to 6 miles--and 2½ years where baselines are drawn across bays--Denmark may be required to do the same. West Germany, the Netherlands, and possibly Belgium and France would wish to negotiate with Denmark in regard to their historic fishing off Danish coasts.

Article 10 of the Fisheries Convention provides that nothing in the Convention shall prevent establishment of a special regime in matters of fisheries in a number of instances, including "(c) as between Denmark, Norway, and Sweden," and "(f) in the Skagerrak and Kattegat." Thus, Denmark, Norway, and Sweden may conclude special arrangements in those waters. The Convention of December 31, 1932, between Denmark and Sweden covers some but not all of the boundary waters. There is no similar agreement with Norway. Although Norway is concerned with Skagerrak waters it has not enforced its 12-mile limit in that area. Representatives of Denmark, Norway, and Sweden have held preliminary discussions about fishing limits in the waters between their coasts and may be expected to become more serious about them in the future. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, May 27, 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 49; April 1964 p. 41; February 1964 p. 59; January 1964 p. 35.

WATER PURIFICATION AND PROTEIN EXTRACTION PROCESS MAY BE APPLIED TO FISH REDUCTION INDUSTRY:

A purification and protein extraction process from waste water, which was invented in Denmark, has been used in a potato flour factory in Jutland, Denmark, and is now to be used in the Danish fish meal, dairy, and meat slaughtering industries.

Although earlier experiments were not successful, a small pilot plant at the Jutland potato factory, which has been using the process since November 1963, has so far confirmed blueprint calculations, according to a spokesman of the Chemistry Department, Copenhagen Technological Institute, which assisted the inventor in development of the new process.

The Danish inventor of the process stated that the reason the potato flour factory was chosen for the experiments was because in that type of production large quantities of waste water with relatively little protein content is turned out. Should the process prove effective under those conditions, then it would be even more effective under more favorable conditions in other industries such as those for fish meal and dairy products. Experiments in the starch industry are therefore considered completed and the inventor has turned to experiments in other industries.

The project has not yet been developed beyond the pilot-plant stage, but the inventor of the process claims that he is negotiating with some 80 industries all over the world, which have expressed interest in the process. Also, he has been negotiating with three different United States companies concerning representation on the American market. He stated that the purification plant will eventually be constructed by a large internationally known firm. Newspaper reports previously indicated that components for the plant would be supplied by firms in Denmark, Sweden, Norway, and the Netherlands.

According to the inventor, the process consists of a consecutive precipitation with subsequent purification and drying. The precipitation is brought about by the addition to the waste water of sulphuric acid and a special chemical made by the inventor, which at the first stage removes 50 percent of the nitrogen (protein), all starches and all pulps, if any exist. Dur-

Denmark (Contd.):

ing the second stage of the process, all sugar and 99 percent of the remaining nitrogen are removed. As a result, the BOD (biological oxygen demand) of the waste water is reduced to 1/2 percent of the original and the potassium permanganate content to less than 100 mg./l. The process is automated and requires little manual attention.

While the pilot plant has worked only with the processing of about five metric tons of waste water per hour, the inventor estimates that a regular industrial plant designed for a small potato flour factory should process about 70 tons of water per hour. Such a plant would cost about US\$58,000 to construct. It would turn out about 158 kilograms (348 pounds) of dry matter per hour at a cost of about 6-1/2 cents per kilogram (2.2 pounds). The inventor maintains that the product (according to laboratory tests), if used for fodder purposes, would realize about \$13.00 per 100 kilograms because of its high content of essential amino-acid vitamins. Application of the product in the chemical industry might eventually, he envisions, bring higher yields. The inventor reportedly holds patent rights to the process. (United States Embassy, Copenhagen, May 13, 1964.)



German Federal Republic

FISH MEAL AND MARINE OIL INDUSTRY TRENDS, 1963:

Fish Meal: In 1963, there was a decline in the use of fish meal for animal feed in West Germany and a corresponding drop in imports. Peruvian shipments of fish meal to West Germany in 1963 were down 19 percent from the previous year, although Peru was still the dominant supplier. The decline was partly offset by larger shipments from Norway, Iceland, and the South Africa Republic.

Items	1964	1963	1962
	(1,000 Metric Tons)		
Supply:			
Opening stocks, January 1	10	8	11
Production	85	85	86
Imports	320	302	338
Total supply	415	395	435
Disposition:			
Exports	5	6	4
Domestic disappearance:			
Animal feed	400	381	423
Ending stocks, December 31	10	8	8

¹/Includes small amounts of meat meal.

A moderate increase in the consumption of fish meal is expected in 1964 as a result of an anticipated increase in the demand for feed for laying hens and pigs. Any increase in demand will probably result in higher imports, since domestic production is expected to continue at the level of recent years.

Table 2 - West Germany Imports of Fish Meal, 1962-1963

Country of Origin	1963	1962
	.. (Metric Tons) ..	
Denmark	6,815	7,617
Iceland	19,007	16,312
Netherlands	2,300	3,833
Norway	10,461	4,585
Portugal	6,340	5,835
Angola	3,693	8,797
Morocco	4,898	3,852
South Africa Republic	23,375	16,865
Chile	3,876	3,672
Peru	207,580	255,222
Pakistan	2,282	2,138
Other countries	4,701	3,131
Total	295,328	331,859

Note: Total imports reported above are less than those shown in table 1.

Marine Oil Foreign Trade: West German imports of whale oil in 1963 were up 12 percent from those in 1962 due mainly to larger shipments from Japan, because whale oil imports from most other producing countries were down.

Table 3 - West German Foreign Trade in Marine Oil, 1962-1963

Commodity & Country of Origin or Destination	1963	1962
	.. (Metric Tons) ..	
Imports:		
Whale Oil:		
United Kingdom	2,187	5,578
Netherlands	5,943	6,990
Norway	11,515	13,223
Portugal	1,013	329
Peru	1,061	758
Japan	42,249	29,493
Australia	158	455
Other countries	2,062	2,219
Total whale oil	66,188	59,045
Fish Body Oils:		
Denmark	1,696	3,489
Iceland	1,410	7,298
Netherlands	2,691	1,539
Norway	3,880	3,803
Portugal	4,072	2,846
Angola	3,009	1,989
United States	11,371	7,635
Chile	2,522	5,531
Peru	31,627	29,618
Other countries	2,827	1,068
Total fish body oils	65,105	64,816
Exports:		
Whale oil	441	2,588
Fish body oil	17,992	20,754

There was a substantial gain in imports of menhaden oil from the United States in 1963 and imports of fish oil were also up from Peru, Angola, Portugal, and the Netherlands. But the gain was about offset by a decline in fish oil shipments from Denmark, Iceland, and Chile. Total imports of fish oil in 1963 were almost the same as in 1962.

German Federal Republic (Contd.):

West German exports of marine oil in 1963 consisted mainly of fish body oil. (United States Embassy, Bonn, April 10, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 69.

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NEW OCEANOGRAPHIC RESEARCH VESSEL LAUNCHED:

Germany's newest and largest oceanographic research vessel, the Meteor, was launched in Bremenhaven on February 8, 1964. The 2,740-ton research vessel is being made ready for participation in the International Indian Ocean Expedition in October 1964. (National Oceanographic Data Center, Newsletter, March 31, 1964.)

Another new research vessel, the Meteor II, was launched in Germany during August 1963 under the joint ownership of the German Hydrographic Institute of Hamburg and the German Research Association of Bad Godesbert.

Note: See Commercial Fisheries Review, February 1964 p. 68.

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ONE-MAN FIBERGLASS SUBMARINE DEVELOPED:

A one-man submarine made of reinforced fiberglass has been developed by a West German firm. The craft consists of a pressure-tested cabin and two flooding tanks attached to the cabin. It is driven by two 500-watt electric motors which are powered by a battery of 100 amperes per hour. A battery of 286 amperes per hour can also be used.

Power diving and surfacing at any angle are possible with the electric motors. The submarine can also submerge simply by filling both flooding tanks. Compressed air is

carried in two 7-liter bottles to drain the flooding tanks for surfacing. The submarine has a diving range of 50 meters (164 feet). Surface speed is approximately 9 kilometers (5.6 miles) per hour and submerged speed about 6 kilometers (3.7 miles) per hour. With the use of full motor power, the standard battery will last for 2½ hours of operation and the special battery will last for 7 hours. Sufficient oxygen is carried in a 1-liter bottle to remain submerged for 4 hours.

The length of the fiberglass submarine is 3.1 meters (10.2 feet), the largest diameter is 0.7 meter (2.3 feet), the largest width is 1.6 meters (5.2 feet), and the largest height is 1.4 meters (4.6 feet).

Searchlights can be mounted inside or outside the submarine and special instruments can be provided for research purposes.

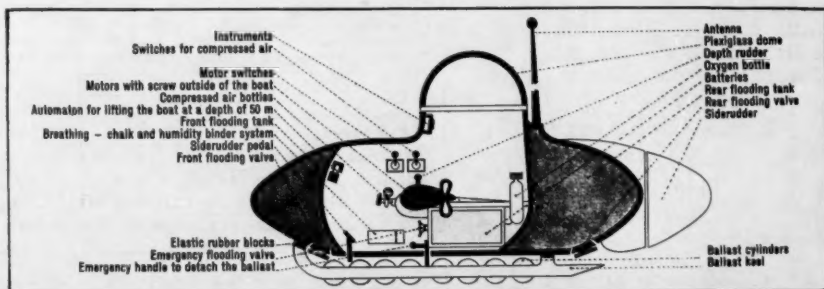


Ghana

OUTLOOK AND PLANS FOR FISHING INDUSTRY EXPANSION:

The production goal of the Ghana Fishing Corporation over a 7-year development period is 150,000 metric tons, according to an interview given by an official of that organization in May 1964, as reported in Ghana newspapers. In order to achieve that goal, international waters will be fished and carrier vessels will be used to collect fish stored by the Corporation's trawlers at sea which will be able to stay out fishing for longer periods than at present. By the end of the 7-year period, the Corporation plans that its staff would be increased from the present 600 to 2,000 workers.

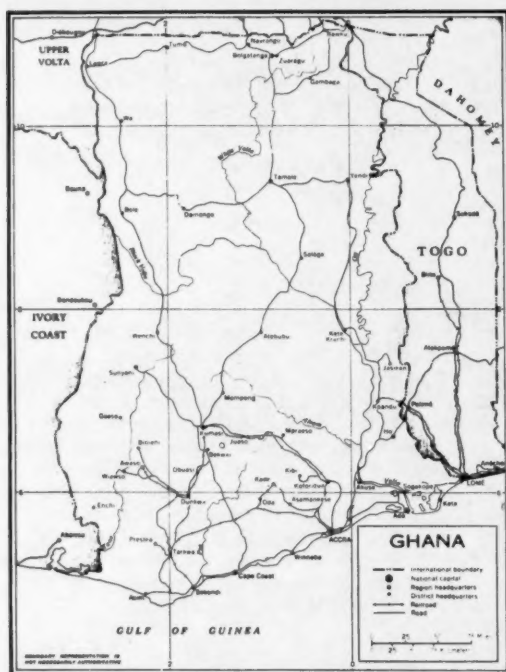
Plans call for the construction at Tema of two modern fish-processing plants by the end



Artist's sketch of one-man fiberglass submarine.

Ghana (Contd.):

of 1966 capable of turning out canned, smoked, and salted fish. The daily capacity of the canning plant will be 60,000 cans of sardines. The complex of fish-processing plants at Tema, designed by Soviet experts, is expected to process close to 12,500 tons of fish a year, chiefly sardines, and produce up to 30 million cans of fish, almost 1,300 tons of smoked fish, and up to 900 tons of fish meal and oil. The various plants will also serve as a center for training Ghanaian fishing specialists.



The Corporation's marketing and distribution plans call for the construction of cold-storage warehouses along the coast at Ema and Takoradi, and smaller ones in the rural areas. The cold-storage plants would be supported by a fleet of refrigerated trucks.

According to the Corporation spokesman, that organization as a State enterprise, plans to eliminate the middle man in the sale of fish. This would be achieved mostly by the daily sale of fish to the fishing cooperatives. The Government will also sponsor a program to send Ghanaians overseas for training in

scientific fishing, vessel engineering and mechanics, and other specialized training. (Fishery Attache, Abidjan, May 22, 1964, and Ghana Newspaper Reports.)

FISHERY LANDINGS UP SHARPLY IN 1963:

Ghana's marine fishery landings in 1963 amounted to 89,304 metric tons, an increase of 42.7 percent from the previous year's landings and nearly three times greater than the 1961 landings. A good part of the gain in 1963 was due to increased landings by foreign vessels (mostly Japanese and Soviet) on charter to the government-controlled Ghana Fishing Corporation.

Table 1 - Ghana's Marine Fishery Landings By Types of Vessel, 1963 with Comparisons

Type of Fishery	1963	1962	1961
... (Metric Tons) ...			
Canoe Fisheries:			
Herring	6,964	16,507	15,141
Line	2,401	2,005	859
Other	26,340	14,303	11,470
Total canoe landings . . .	35,705	32,815	27,470
Motor Fishing Vessels:			
Trawl	9,431	1,084	1,110
Line	477	546	353
Herring	1,974	2,110	1,481
Tuna	6,868	5,108	3,564
Other	1,494	406	-
Total motor fishing vessel landings	20,244	9,254	6,508
Fishery Contracts:			
From Japanese Vessels . . .	-	167	-
From U.S.S.R. Vessels . . .	-	20,352	-
Ghana Fishing Corporation . .	14,094	-	-
Foreign Corporations	16,847	-	-
Local Corporations	2,412	-	-
Total	33,355	20,519	-
Grand total	89,304	62,588	33,978

Source: Ghana Ministry of Agriculture, Fisheries Inspectorate Unit.

Table 2 - Catch Composition of Ghana's Fishery Landings By Species and Type Vessel, 1963 with Comparisons

Species by Type of Vessel	1963	1962	1961
... (Metric Tons) ...			
Herring Landings:			
Canoe	6,964	16,507	15,141
Motor vessels	1,974	2,110	1,481
Total herring landings . . .	8,938	18,617	16,622
Other Species:			
Canoe	28,741	16,308	12,329
Motor vessels	18,269	7,143	5,028
Fish contracts	33,356	20,520	-
Total other species	80,366	43,971	17,357
Tuna transhipped out of Ghana .	5,665	4,643	3,564
Used for domestic consumption .	83,639	57,945	30,414

Source: Ghana Ministry of Agriculture, Fisheries Inspectorate Unit.

Although herring landings by canoes were down sharply from the 16,500 tons landed in

Ghana (Contd.):

1962, there were substantial increases in landings of other species. As a result, total landings by canoes were up 8.8 percent from a year earlier and those by motorized vessels increased 119 percent from 1962. The 1963 tuna landings of nearly 7,000 tons were up 34 percent from the previous year, of which 5,665 tons were transshipped out of Ghana.

With the recent introduction of underwater light fishing for herring at night, prospects are good for a considerably better 1964 herring season. Also, with additional deliveries of the total of 44 trawlers and purse-seiners on order from four countries (Japan, U.S.S.R., Norway, and the United Kingdom) scheduled for 1964, the prospects for an overall increase in Ghana fisheries production in 1964 are bright. (Fishery Attache, United States Embassy, Abidjan, May 22, 1964.)

FIRST NORWEGIAN-BUILT STERN TRAWLER LAUNCHED:

The trawler Shama, the first of 7 trawlers being built in Norway for the government-controlled Ghana Fishing Corporation in Ghana, was launched in April 1964. The Norwegian shipyard is to build all 7 of the trawlers and will also send Norwegian experts to Ghana with the vessels. The experts will be in command of the vessels for 18 months.

The 7 vessels will all be stern trawlers with an overall length of 231 feet 7 inches, and will be powered by Diesel engines generating 1,960 b. hp., coupled to reversible propellers.

Fish will be stored in two insulated cargo holds on the main deck of the vessels and will be frozen to -20° F. in the tropical climate. Hydraulic deck machinery and electrically operated transport belts on the vessels will facilitate handling of the fish at sea and in port.

The Ghana Fishing Corporation has ordered 40 trawlers from Norway, the United Kingdom, and Japan. Norway has also agreed to train Ghanaian fishermen. (The South African Shipping News and Fishing Industry Review, April 1964.)



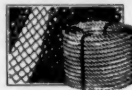
Greece

FREEZER-TRAWLER LANDINGS, JANUARY-MARCH 1964:

The Greek fleet of refrigerated trawlers and carrier vessels operating in the Atlantic landed 1,180 metric tons of frozen fish in Greek ports in March 1964, down 19 percent from landings of 1,458 tons in the same month of the previous year.



Greek frozen fish landings during January-March 1964 amounted to 4,422 tons, compared with landings of 4,392 tons in the same period of 1963 and 3,760 tons in the first quarter of 1962. (Alieia, April 1964.)



Honduras

FISHERIES TRENDS, FIRST QUARTER 1964:

A fishery firm operating in Honduras shipped 500,000 pounds of shrimp to the United States during the 7-months' season that ended in the first quarter of 1964. The firm employs 14 fishing vessels.

A fishing cooperative at the port of San Lorenzo in southern Honduras has built a cold-storage warehouse with the aid of the Corporation for American Relief Everywhere (CARE) and other groups. The cooperative now delivers fresh fish regularly to Tegucigalpa in a truck donated through CARE by the

Honduras (Contd.):



employees of a United States insurance firm. (United States Embassy, Tegucigalpa, May 20, 1964.)



Iran

FISHERY TRENDS AND DEVELOPMENTS:

A \$15 million construction loan by the United States to Iran for the development of the Port of Bandar Abbas (in the southeast part of the Persian Gulf) is expected to give impetus to Iran's commercial fishing industry in the south, which presently is very limited.

There is little commercial fishing now being done by Iran in the Persian Gulf despite a reported abundance of fish and shrimp. There is a fish cannery in Bandar Abbas operated by the Iranian National Fishing Company (Shilat), but it produced only about 300,000 cans (4-ounce) of fish in each of the past few years as against its potential capacity of several million cans a year. At times the plant is completely shut down because of a lack of fish for processing. There are now two foreign commercial fishing firms operating in the Persian Gulf—one from Kuwait and the other from Pakistan. Each of those firms has a well-equipped refrigerated mothership and a fleet of smaller catcher vessels.

The local Governor of the Bandar Abbas area said he was confident that the limited and intermittent commercial fishing done by a fishing company in the southern part of Iran would be resumed full time in the near future and that although that company was owned by the Iranian Government, it would be independent of Shilat.

Officers of the United States Consulate at Isfahan reported that two persons with whom they spoke in Bandar Abbas expressed interest in either a joint venture with a United States fishing firm, or in acting as export agents for Iranian Persian Gulf fishery products for export to the United States. Several such fishery joint ventures have for various reasons not been very successful in the past. (United States Consulate, Isfahan, March 31, 1964.)

Note: See *Commercial Fisheries Review*, January 1964 p. 53; October 1963 p. 52, July 1963 p. 79.



Ireland

SCALLOP GROUNDS DISCOVERED:

Scallops have been found in commercial quantities off the southeast coast of Ireland in St. George's Channel. The Irish Government sponsored the scallop investigation following reports that scallops had been taken

Ireland (Contd.):

in trawls about 11 miles from Dunmore East, which is the center of a herring fishery. The crew of a 50-foot commercial fishing vessel has been instructed in the dredging method of taking scallops and those involved in the project are confident that a commercial scallop fishery will develop. (Fish Trades Gazette, April 25, 1964.)

UNITED STATES TEAM
BEGINS FISHERIES SURVEY:

Four specialists from the United States Bureau of Commercial Fisheries arrived in Ireland in late April 1964 to implement the United States-Irish cooperative fishery research project. A representative of the United States team said the group would study the development plans of the Irish Sea Fisheries Board, and assist in the establishment of a research-development organization.

The Irish fishing industry is generally limited to inshore operations. After a 2-months survey of Irish operations, the United States team may be able to offer suggestions concerning fishing, processing, and marketing, since the species exploited by the Irish industry are similar to some of those caught by United States fishermen. (Fish Trades Gazette, April 25, 1964.)



Japan

CANNED TUNA IN BRINE
SALE TO UNITED STATES:

The Japanese tuna packers and exporters (who were negotiating export prices) have settled on a promotional allowance of US\$1 a case (48 7-oz. cans) for the 200,000 cases of whitemeat tuna in brine for export to the United States which were to be offered for sale on May 19, 1964. The exporters had hoped to offer for sale 170,000 cases of whitemeat tuna in brine and 100,000 cases of light meat tuna in brine for export to the United States, but their request was rejected by the packers. However, the packers granted the full promotional allowance requested by the exporters, which brought the price of the solid white pack down to \$12.60 a case f.o.b. Japan.

Negotiations were still in progress over the matter of promotional allowances for the solid light meat tuna in brine pack and lower grade packs. (Suisancho Nippo, May 16 & 18, 1964.)

EXPORTS OF CANNED TUNA IN BRINE
TO U. S. BY DESTINATION:

New York City and Boston again led all other United States cities as the chief markets for Japanese canned tuna in brine, according

Japanese Exports of Canned Tuna in Brine to U. S. by Destination Points, 1962-1963				
Destination	1963		1962	
	No. Cases	Percent of Total	No. Cases	Percent of Total
Total	2,234,434	100	2,110,137	100
New York	612,571	27.42	564,523	26.75
Boston	524,834	23.49	492,920	23.36
Baltimore	188,618	8.44	142,959	6.77
Chicago	175,735	7.86	174,785	8.28
Philadelphia . .	120,631	5.40	129,785	6.15
Los Angeles . . .	96,250	4.31	85,716	4.06
San Francisco . .	96,192	4.30	87,611	4.15
New Orleans . . .	58,822	2.63	44,877	2.13
Seattle	54,138	2.42	41,413	1.96
Houston	35,902	1.61	32,238	1.53
Detroit	31,176	1.40	33,307	1.58
Others	239,565	10.72	280,003	13.28

to a survey conducted by the Japan Canned Foods Exporters Association. (Suisan Tsushin, May 18, 1964.)

STANDARD PRICES ESTABLISHED FOR
CANNED WHITEMEAT TUNA IN BRINE:

Standard prices for Japanese canned whitemeat tuna in brine packed for export to the United States have been established by the Ja-

Japanese Canned Whitemeat Tuna in Brine Prices ^{1/} , 1964					
Pack	Can and Case Size	Price Per Case			
		Yokohama		Shimizu	
		Yen	US\$	Yen	US\$
Fancy A	13-oz. 24's	2,977	8.27	2,984	8.29
" B	" "	2,907	8.07	2,914	8.09
" A	7-oz. 48's	3,202	8.89	3,211	8.92
" B	" "	3,132	8.70	3,141	8.72
" A	3.5-oz. 48's	1,863	5.17	1,870	5.19
" B	" "	1,823	5.06	1,830	5.08
" A	66-oz. 6's	3,427	9.52	3,434	9.54
" B	" "	3,357	9.32	3,364	9.34
" A Flake	6.5-oz. 48's	2,332	6.48	2,341	6.50

^{1/}Prices shown represent packers' prices to the Japan Canned Tuna Sales Company.

pan Canned Tuna Packers Association at a general meeting in mid-May 1964. (Suisancho Nippo, May 21, 1964.)

Japan (Contd.):

EXPORTS OF CANNED TUNA SPECIALTY ITEMS, 1963:

Japanese exports of specialty canned tuna products (other than those packed in brine and in oil) totaled 455,986 cases in fiscal year 1963 (April 1963-March 1964), according to data compiled by the Japan Canned Tuna Packers Association. West Germany was the biggest market, accounting for 66 percent of exports (301,201 cases), followed by the Netherlands with 15 percent (66,594 cases), Belgium 8 percent (35,188 cases), Canada 4 percent (20,025 cases), and Great Britain 2 percent (10,250 cases). Twenty-six other countries accounted for the remaining 5 percent (22,728 cases). (*Suisancho Nippo*, May 25, 1964.)

Note: The press report gave the exports as 438,896 cases. Tabulation of data by countries of destination showed exports totaled 455,986 cases.

CANNED TUNA MARKET TRENDS:

The Japan Tuna Packers Association, at a directors meeting held on June 3, 1964, at Tokyo, decided to reduce by 300,000 cases the quantity of canned tuna in brine that the Association had planned to consign to the Canned Tuna Sales Company (for export to the United States) for the third quarter (January 1-March 31, 1965), from 500,000 cases to 200,000 cases. At the same time, the Association adopted the following measures:

1. Change the consignment ratio of lightmeat to whitemeat. Henceforth, consignment to the Sales Company of lightmeat tuna will be held below the 50-percent level, and of whitemeat above the 50-percent level. Previously, light meat was limited to over 20 percent but under 50 percent of the total consignment.

2. Consignments to the Sales Company to consist of the following ratio of can sizes: 13-oz. pack--20 percent (same as before); 7-oz. pack--35 percent (previously 45 percent); 66-oz. pack--45 percent (previously 35 percent). However, packers may be exempted from this ruling by permission of the Association's Director.

3. Establish a committee (8 members) to develop sales policy to overcome stagnant sales.

The quantity to be consigned to the Canned Tuna Sales Company for the third quarter of

1965 was reduced as a result of declining sales of Japanese canned tuna in brine in the United States. For the business year beginning December 1963, a total of 880,000 cases has been offered for sale by the Sales Company. However, as of May 31, only 450,000 cases of that amount have been shipped to the United States. (*Suisan Tsushin*, June 4; *Nihon Suisan Shimbun*, May 22, 1964.)

JAPAN TUNA PACKERS ASSOCIATION MEMBERS PACK BULK OF CANNED TUNA:

Data compiled by the Japan Tuna Packers Association indicate that in fiscal year 1963 (April 1963-March 1964) its 78 member firms packed a total of 3,811,597 cases of canned tuna in oil and brine for export, and that 21 nonmember firms packed a total of 100,689 cases of tuna in brine for export to the United States.

Production of the ten largest packers totaled 1,527,274 cases, equal to 40 percent of the total year's pack produced by the firms affiliated with the Association. Of the remaining 68 firms, 6 companies packed from 75,000-100,000 cases (average 84,367 cases), 11 companies packed from 50,000-75,000 cases (average 64,908 cases), 17 companies from 25,000-50,000 cases (average 36,500 cases), and 34 companies less than 25,000 cases (average 12,552 cases).

The 21 non-Association members packed an average of 4,795 cases during the fiscal year. (*Suisancho Nippo*, May 22-25, 1964.)

EXPORT TARGETS FOR FISHERY AND AQUATIC PRODUCTS, FISCAL YEAR 1964:

The total value of Japan's proposed export target for fishery and aquatic products is US\$284.9 million. Canned fishery products account for 44.0 percent of the total value, frozen and fresh products 35.5 percent, cultured pearls 18 percent, salted and dried products 2.0 percent, and agar-agar 0.4 percent. The 1964 export target value represents an increase of 12.3 percent over the actual exports in 1963 and 9.8 above the value of exports in 1962.

The proposed export target of canned fishery products in 1964 of 11.2 million cases, valued at \$125.4 million, is an increase in quantity of 2.8 percent and a decrease in value of 0.1 percent as compared with exports of similar products in 1963. Comparing proposed exports in 1964 with those of 1963 on an item to item basis, the following changes in quantity and value are noted: tuna up 8.0 percent in quantity and 8.9 percent in value; saury up 8.1 percent in quantity and 11.5 percent in value; horse-mackerel up 39.5 percent in quantity and 31.5 percent in value; salmon down 6.2 percent in quantity and 6.5 percent in value; crab meat down 7.0 percent in quantity and 7.1 percent in value; other fish and shellfish down 4.2 percent in quantity and 4.3 percent in value.

Japan (Contd.):

Japanese Export Targets for Fishery and Aquatic Products, Fiscal Year 1964 With Comparisons						
Product	FY 1964		FY 1963		FY 1963	
	Export Target Qty.	Value ^{1/}	Export Target Qty.	Value ^{1/}	Actual Exports Qty.	Value ^{1/}
	1,000 Cases	US\$ 1,000	1,000 Cases	US\$ 1,000	1,000 Cases	US\$ 1,000
Canned Fish:						
Tuna	4,450	37,513	4,250	34,012	4,119	34,456
Salmon	1,395	43,862	1,710	51,124	1,487	47,003
Crab meat	438	11,004	440	11,077	471	11,841
Sardines	100	780	500	3,625	180	1,363
Saury	1,650	10,680	1,370	7,773	1,527	9,582
Horse-mackerel	600	3,948	560	3,398	430	3,003
Other fish and shellfish	2,590	17,521	1,855	14,527	2,702	18,301
Total canned	11,223	125,408	10,685	126,436	10,916	125,549
Frozen Fish & Shellfish:						
Tuna	177,804	61,627	174,400	57,184	136,972	50,277
Swordfish	6,800	4,320	7,700	5,700	5,927	4,257
Salmon	1,500	1,940	2,000	2,000	975	1,260
Rainbow trout	1,500	1,415	1,200	1,080	1,373	1,295
Shrimp	1,500	2,174	2,000	3,200	1,164	1,687
Other	55,000	13,530	45,000	14,250	34,551	8,507
Total frozen	244,104	85,006	232,300	83,414	180,962	67,283
Fresh fishery products	55,500	16,095	2/	10,000	20,157	5,858
Other Products:						
Salted and dried	4,200	5,800	5,440	6,000	4,301	5,795
Agar-agar	350	1,260	610	1,900	335	1,200
Pearls (cultured)	Kans ^{3/} 19,000	51,300	Kans ^{3/} 15,500	41,200	Kans ^{3/} 18,040	47,938
Total value of all products		284,869		268,950		253,621

^{1/}Based on L.C.B. prices in Japan.^{2/}Net gross.^{3/}In Kans: One Kan equals 8.367 pounds.

Source: Export approval statistics and customs clearances.

The proposed exports of frozen fishery products for 1964 total 244,104 metric tons valued at \$85 million. Compared with the 1963 exports, they are higher by 34.9 percent in quantity and 26.3 percent in value. Notable in the proposed exports of frozen fishery products for 1964 is the sharp increase for tuna—greater by 29.8 percent in quantity and 22.6 percent in value than the previous year's exports.

Under the proposed export target for 1964, shipments of cultured pearls and agar-agar will be maintained at about the 1963 level. The proposed exports of fresh fishery products in 1964 show the sharpest percentage increase over the previous year's exports—75.3 percent more in quantity and 174.8 percent more in value. (Fisheries Attache, United States Embassy, Tokyo, May 11, 1964.)

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SUMMER ALBACORE FISHERY AND EXPORT TRENDS:

Some 5,000 metric tons of albacore tuna were reported to have been landed as of early June 1964 in Japan since the beginning of the summer albacore fishery. Of that amount, 1,500 tons were estimated to have been bought by Japanese traders engaged in the frozen tuna export trade.

As of early June, the Japanese traders are reported to have signed contracts with United States tuna packing firms amounting to 2,000 to 2,500 tons of albacore. Those traders will need to purchase an additional 500-1,000 tons of albacore to meet their United States com-

mitments, but are expected to be able to do so readily due to the large quantity of albacore landed during June (ranging from 300-500 tons a day) and also due to slow buying on the part of Japanese tuna packers.

The export price of frozen albacore has declined steadily since the beginning of the summer fishery. From a high of US\$400 a short ton, the c.i.f. price has dropped to \$360 a ton, and offers of \$350 a ton are now being made. (Suisan Tsushin, June 9, 1964.)

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TUNA BASES AT PENANG OPERATE AT A LOSS:

The Japanese fisheries company which operates the tuna bases at Penang, Malaysia, and Port Luis, Mauritius Island, and the tuna cannery at Penang, held its sixth annual stockholders meeting at Tokyo on May 30, 1964. For the business year April 1963-March 1964, that firm is reported to have lost 70.2 million yen (US\$195,000). That sum is in addition to the losses carried over from the previous business year, which totaled 34.7 million yen (US\$96,389).

The operational deficit of that firm was attributed to the difficulty it faced in attracting sufficient tuna vessels to operate out of its bases, thereby preventing the economic utilization of its bases and plant facilities. (Suisan Tsushin, June 1, 1964.)

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TUNA FISHING TRENDS IN SOUTH PACIFIC:

Japanese tuna fishing about 200 miles north of the New Hebrides Islands, South Pacific, improved greatly toward the end of May 1964. The six Japanese tuna vessels operating out of the tuna base at Espiritu Santo, New Hebrides Islands, had concentrated in that area and were averaging 3 metric tons of tuna per vessel per day as compared to 1.8 tons per day prior to May 20.

The tuna mothership Yuyo Maru (5,040 gross tons), accompanied by 55 catcher vessels, departed Tokyo on May 27 for the South Pacific tuna fishing grounds off the Fiji Islands. Catch target of the mothership, which was scheduled to remain on the fishing grounds until August 25, was 5,400 metric tons of tuna, spearfish, and shark.

The Yuyo Maru, which commenced fishing operations on June 6, was reported to be catch-

Japan (Contd.):

ing an average of about 4 metric tons of tuna a day per catcher vessel. The highest catch registered by a catcher vessel of that fleet is 9 tons a day.

The Nojima Maru (8,800 gross tons) tuna mothership fleet, which started fishing operations on May 26 in the vicinity of Tahiti, was reported to be averaging close to 3 tons of tuna a day.

The firm operating the Nojima Maru plans to transship to the United States about 3,900 metric tons of tuna caught by that mothership. That firm has not as yet selected a port of transshipment. The port of Papeete, Tahiti, reportedly is not suitable and an island near Tahiti is expected to be selected as the transshipment port. The carrier vessels Tsukishima Maru and Hokko Maru will transport the tuna to the United States. The Tsukishima Maru was to have left Kobe on June 3. The Hokko Maru was scheduled to leave Japan on July 7. (Suisancho Nippo, May 27 and 29, 1964.)

TUNA FISHING TRENDS IN ATLANTIC OCEAN:

Some 150 Japanese tuna vessels operating in the Atlantic Ocean are reported to be catching large quantities of bluefin and big-eyed tuna. The majority of the bluefin is said to range in size from 400 to 800 pounds. The preponderance of those two species in the tuna catch is said to have created a marketing problem for the Japanese trading firms. This is because tuna importing countries such as Italy prefer yellowfin and are willing to accept mixed species of tuna provided the shipments consist mainly of yellowfin. The Atlantic tuna catches are said to be presently running 30 percent yellowfin to 70 percent bluefin and big-eyed. (Suisan Tsushin, June 6, 1964.)

FIRM TO OPERATE PURSE-SEINE FLEET IN ATLANTIC:

A Japanese fishing firm's application to engage in purse-seine fishing off the coast of West Africa, using Ghana as a base, has been approved by the Fisheries Agency. The firm plans to conduct a mothership-type operation, employing one mothership and two 90-ton

purse-seine vessels. Assignment to that fleet of 5 pole-and-line vessels operating out of Ghana is also being contemplated.

Fishing operations (primarily for tuna and mackerel) are expected to begin in August. The Japanese firm is planning on employing the 1,700-ton freezer ship Chichibu Maru No. 2 as the mothership. (Suisancho Nippo, May 15 & 18, 1964.)

HALIBUT MOTHERSHIP RETURNS:

The Japanese 700-ton mothership Fuji Maru No. 3, specially chartered to fish for halibut in Area 3B North Triangle (Eastern Bering Sea), was scheduled to arrive in Tokyo on May 23, 1964. Reportedly, that mothership caught a total of 350 metric tons of fish, consisting of 100 tons of halibut and black cod, and the remainder mainly rockfish. (Suisan Tsushin, May 22, 1964.)

CANNED PINK SALMON EXPORT PRICES:

The Japan Land Salmon Packers Association, at a directors' meeting held in Hokkaido in early June, according to Minato Shimbun, June 5, 1964, has established the following standard export (f.o.b.) prices for canned pink salmon.

Product	Price Per Case
	US\$
Canned Pink Salmon:	
Fancy 48 cans/cs. (8-oz.)	10.60
" 96 cans/cs. (8-oz.)	12.65
Standard 48 cans/cs. (8-oz.)	9.60
" 96 cans/cs. (4-oz.)	11.65

JAPANESE NORTH PACIFIC MOTHERSHIP SALMON PRICES:

The Japan Federation of Salmon Fishermen's Associations (NIKKEIREN) and the salmon mothership companies have reached agreement on the following ex-vessel prices for fresh whole salmon delivered by the catcher vessels to the motherships:

Species	1964 Price		1963 Price	
	Yen/kg.	U.S. Cents/lb.	Yen/kg.	U.S. Cents/lb.
Red	213	26.8	203	25.6
Chum	115.5	14.6	110	13.9
Pink	93	11.7	88.5	11.2
Silver	126	15.9	120	15.2
King	126	15.9	120	15.2

The 1964 salmon prices represent a flat 5 percent increase over 1963. The price negotiations were concluded on May 15, 1964, the day that the 11 salmon motherships and

Japan (Contd.):

369 catcher vessels were scheduled to depart for the fishing grounds, following the issuance of a directive issued by the Fisheries Agency (on the afternoon of May 15) calling on the NIKKEIREN and the mothership companies to make every effort to reach a settlement in good faith so that the fleet could depart as scheduled; otherwise, any delay in the fleet departure may well affect the departure date of the fleet in 1965.

The NIKKEIREN had called a mass meeting on the morning of the 15th of the 2,000-odd vessel owners and fishermen and threatened to stop the departure of the salmon fleet. The fleet departed shortly after the price settlement was reached, but about 10 hours later than scheduled. (Suisancho Nippo, May 16; Suisan Tsushin, May 18, 1964.)

Editor's note: We have had several inquiries concerning the seemingly high prices for salmon paid to the Japanese fishermen. We have checked our sources carefully and believe the published prices are reliable. Despite the high cost of the raw product to the Japanese packers, we believe they are able to maintain their competitive position on the world canned salmon market for the following reasons:

1. **Labor cost:** The labor cost is very low. For example, our understanding is that the workers on the Japanese motherships receive an average salary of about \$145 a month. At shore-based plants in Hokkaido, the cannery workers, mostly women, are provided, in addition to room and board, a monthly salary ranging from \$20-30 a month.

2. **Meat recovery:** Recovery of meat per pound of fish is believed to be higher in Japan than in the United States. For example, meat attached to the head section is recovered manually by the Japanese and canned as "tid-bits."

3. **Utilization of byproducts:** Japanese packers pack salmon caviar incidentally to their canning operations. The value of this product, which has a special market in Japan, is reported to be substantial. For example, in 1963 processed pink salmon roe (caviar) is said to have sold for \$4.00 a pound on the wholesale market. First grade roe of other species sold for about \$20-25 a pound. The fact that Japan has arranged to obtain salmon roe from United States canneries further attests to the economic value of that product. Another byproduct is salmon carcasses. For example, on the motherships, scraps remaining from the canning operations are processed for later conversion into fertilizer.

4. **Other products:** Large quantities of pink and chum salmon are salted. The return to the packer on the salted product compares favorably to that for the canned product. Smoked salmon is becoming a popular item in Japan. Smoked red salmon has a ready market in West Germany and the United Kingdom. The return to the producer on this specialty item is reported good.

SALMON CATCH BY MOTHERSHIP FLEETS:

The salmon catch for the first ten days of the Japanese mothership fleets operating in the northern waters was reported to be running 65 percent reds, 32-33 percent chums, and 2-3 percent pinks. (Suisan Tsushin, June 2, 1964.)

HOKKAIDO PACKERS BEGIN PACKING PINK SALMON:

Japanese salmon packers in Hokkaido are reported to have started packing pink salmon quarters, paying about 220 yen a kilogram (US\$0.277 a lb.) for the fresh fish. Reportedly, at that price they are barely able to show a profit. The high cost of the raw product is attributed to the earliness of the fishing season and scarcity of fish.

The pink salmon fishery off eastern Hokkaido was expected to peak toward mid-June at which time the Hokkaido packers planned to start putting up pink halves. Reportedly, to be able to pack that style at a profit the ex-vessel pink salmon price will have to come down to the 180-190 yen a kilogram (US\$0.206-0.217 a lb.) level. (Suisan Tsushin, June 2, 1964.)

Editor's note: Salmon caught by the Japan-based fishing vessels operating in the North Pacific east of the Kurile Islands and Hokkaido are usually sold by auction on the open market. They command higher prices than those prevailing in the salmon mothership fishery.

In the case of the mothership fishery, prices are negotiated between the fishermen and mothership companies for the entire salmon season. The 1964 pink price to the fishermen engaged in the mothership fishery is \$0.117 per pound.

SALMON FISHERMEN REQUEST TUNA FISHING LICENSES:

Japanese salmon fishermen engaged in the mothership-type salmon fishery have begun a concerted national effort to seek six-months tuna fishing licenses for 114 of their salmon vessels (80- to 90-ton), claiming that they need the licenses to ensure their livelihood, which they claim is now wholly dependent on the income derived from one fishery. They are being supported in their demands by the Northern Water Mothership Council (composed of the large companies operating motherships in the northern waters), prefectural Diet representatives, and the Governors of the 13 prefectures in northern Japan, and are taking their case directly to the Minister of Agriculture and Forestry and to the Diet.

The National Federation of Tuna Fishermen's Cooperative Association (NIKKEIREN),

Japan (Contd.):

pointing to recent trends in the tuna fishery, claims that the salmon fishermen's demand violates the recently enacted Revised Fisheries Law. The NIKKEIREN plans a strong opposition to the demand of the salmon fishermen and intends to carry on their fight on a political level also. (Minato Shimbun, June 6; Shin Suisan Shimbun, June 8, 1964.)

ATLANTIC TRAWL LANDINGS, 1963:

The 34 Japanese trawlers operating in the Atlantic Ocean off the coast of Africa landed a total of 91,984 metric tons of fish in 1963, according to preliminary data released by Japan's Fisheries Statistics Section, Ministry of Agriculture and Forestry. This is an increase of 44,000 tons over the 1962 catch made by 32 trawlers.

The 1963 catch consisted of 39,105 tons of sea bream, 20,298 tons of squid, 6,999 tons of octopus, 6,504 tons of mackerel, 6,631 tons of cod, and 12,447 tons of miscellaneous species, with a total value of 11.2 billion yen (US\$31.1 million). Of the total catch, nearly half (close to 45,000 tons) was exported to Europe, Africa, and the Middle Eastern and Near Eastern countries. The exports, consisting mainly of lower-priced fish, were valued at 2,640 million yen (US\$7.3 million).

Reportedly, the Japanese Atlantic trawl fleet in 1965 is expected to total 52 trawlers. In 1960 there were 5 trawlers engaged in the fishery off West Africa, in 1961 there were 15 trawlers, and in 1962 the number was 32 trawlers. (Suisancho Nippo, June 5, 1964.)

JOINT JAPANESE-CANADIAN FISHING ENTERPRISE IN CANADA PROPOSED:

One of Japan's largest fishing companies has submitted an application to the Ministry of International Trade and Industry to export three 300-ton trawlers to Canada as part of its investment in the company that the firm plans to establish in Newfoundland jointly with a Canadian fisheries company. Should the application be approved, the Japanese firm plans to transfer to Canada the two 300-ton trawlers (Eiyo Maru and Chuyo Maru No. 16) presently fishing in the North Atlantic with the 3,700-ton stern trawler Tenyo Maru No. 3.

The Canadian firm is reported to own processing and freezing facilities capable of handling the catch of ten 300-ton trawlers. The company employs 500 people. (Suisancho Nippo, May 25, 1964.)

KING CRAB FISHING IN BRISTOL BAY IMPROVES

The two Japanese king crab factoryships (Токеи Мару, 5,835 gross tons; and Дайничи Мару, 5,859 gross tons) operating in the Eastern Bering Sea are reported to be doing well after a relatively slow start. They were averaging about 11 crabs a shackle. (Suisan Tsushin, May 18, 1964.)

KING CRAB CANNED PACK AND EXPORTS, FISCAL YEAR 1963:

Japan's pack of canned king crab meat in fiscal year 1963 (March 1963-February 1964) from distant water areas--Bristol Bay, Okhotsk Sea (West Kamchatka), and the Olyutor Sea (off Siberian Coast)--totalled a record of 509,200 cases (48 $\frac{1}{2}$ -pound cans) due to the increase in pack from the Olyutor area. The pack in Bristol Bay and the Okhotsk Sea in 1963 was the same as in the previous year.

During the period 1956-1963, the Japanese king crab meat pack from Bristol Bay has shown almost a fourfold increase while the Okhotsk Sea pack has gradually declined. The Okhotsk Sea pack is subject to quota regulation by the International Northwest Pacific Fisheries Commission (Japan-Soviet Union).

Japanese exports of canned king crab during March 1, 1963-February 29, 1964, totalled

Table 1 - Japanese Exports of Canned King Crab Meat by Destination, March 1, 1963-February 29, 1964

Month	United States	United Kingdom	Continental European Countries	Other Countries	Total
	.....(Standard Cases/1).....				
March ..	14,585	325	2,797	756	18,463
April ..	12,498	-	2,558	523	15,579
May ...	4,469	1,450	2,231	360	8,510
June ...	18,015	1,350	3,772	586	23,723
July ...	23,002	4,862	2,786	275	30,925
August ..	23,149	7,450	4,915	1,002	36,516
September	19,423	10,580	9,353	1,268	40,624
October .	21,115	1,625	6,303	1,705	30,748
November	9,173	10,050	9,070	1,286	29,579
December	14,256	8,438	4,650	823	28,167
January .	10,996	13,575	4,115	906	29,592
February .	15,774	16,765	4,452	1,500	38,491
Total .	186,455	76,470	57,002	10,990	330,917

1/Standard cases of 48 $\frac{1}{2}$ -pound cans.

Japan (Contd.):

Table 2 - Japanese Pack of Canned King Crab Meat by Factoryship and Area, 1956-1963

Area and Factoryship	1963	1962	1961	1960	1959	1958	1957	1956
(Standard Cases ^{2/})								
Bristol Bay (Spring Season)^{1/}:								
Tokei Maru	120,000	60,000	80,000	80,000	70,000	59,850	59,850	59,850
Shinyo Maru	-	-	3/22,000	3/18,100	-	-	-	-
Dainichi Maru	115,000	3/100,000	-	-	-	-	-	-
Bristol Bay (Fall Season)^{1/}:								
Eihin Maru	-	-	3/20,000	-	-	-	-	-
Chichibu Maru No. 2	-	-	3/30,000	-	-	-	-	-
Banshu Maru No. 31	-	-	3/20,000	-	-	-	-	-
Ishiyama Maru	-	4/75,000	-	-	-	-	-	-
Shinyo Maru	-	-	-	-	-	-	-	-
Total Bristol Bay pack	235,000	235,000	172,000	98,100	70,000	59,850	59,850	59,850
Okhotsk Sea:								
Yoko Maru	63,000	63,000	65,000	65,000	69,800	80,000	92,500	92,500
Kaiyo Maru	63,000	63,000	65,000	65,000	69,800	80,000	84,000	73,500
Holuyo Maru	63,000	63,000	65,000	65,000	69,800	80,000	84,000	73,500
Shiranesan Maru	-	-	65,000	65,000	70,600	80,000	84,000	73,500
Seijo Maru	63,000	63,000	-	-	-	-	-	-
Total Okhotsk Sea pack	252,000	252,000	260,000	260,000	280,000	320,000	344,500	313,000
Olyutor Sea (off Siberian Coast):								
Matuhisa Maru	-	-	-	-	-	-	-	54,500
Uji Maru	-	-	-	-	3/3,722	3/1,228	-	-
Ikema Maru	-	-	-	3/14,744	-	-	-	-
Intohima Maru	-	3/1,700	3/4,445	-	-	-	-	-
Shikishima Maru	-	-	-	-	-	-	-	-
Yoko Maru	22,200	-	-	-	-	-	-	-
Total Olyutor Sea pack	22,200	1,700	4,445	14,744	3,722	1,228	-	54,500
Total king crab pack	509,200	488,700	436,445	372,844	353,722	381,078	404,350	427,350

^{1/}Prior to 1961, Japanese king crab fishing in Bristol Bay was authorized only during the "spring season" (April-August). In 1961, the Japanese Fisheries Agency licensed king crab operations in Bristol Bay during the fall months as well as during the spring season.

^{2/}Standard cases of 48 1/2-pound cans.

^{3/}Includes frozen king crab converted, for statistical purposes, to equivalent canned pack with the factor: 1 metric ton frozen crab meat per 100 standard cases of canned crab.

^{4/}Combined production of Ishiyama Maru and Shinyo Maru.

330,917 cases, of which 56 percent was exported to the United States, 23 percent to the United Kingdom, 17 percent to countries in Continental Europe, and about 4 percent to other countries. (Fisheries Attache, United States Embassy, Tokyo, June 4, 1964.)

REACTION TO NEW U. S. LAW ON FISHING IN TERRITORIAL WATERS:

President Johnson's statement on May 20, 1964, when he signed P. L. 88-308 (an act to prohibit fishing in territorial waters of the United States and in certain other areas by vessels other than vessels of the United States and by persons other than United States nationals or inhabitants), that the United States will give full consideration to Japan's long established king crab fishery in Bristol Bay, has dispelled the fear held among the Japanese Government and fisheries circles that the new law might shut out Japan from the Bering Sea crab fishery, according to Japan's

national economic trade journal Nihon Keizai Shimbun, May 21 and 22, 1964.

The periodical states that the new law has given rise to views within the Japanese Government that Japan should restudy her present policy of rigidly adhering to the principle of freedom of the high seas. It points out that great changes are occurring in the international fisheries, with fishing countries generally trending toward adopting the 12-mile territorial sea limit. The periodical adds that Japan's rigid adherence to the principle of freedom of the high seas, in the face of those developments, could lead toward isolating her in international fisheries. To prevent such an adverse situation, opinion is gaining ground within the Japanese Government that Japan should revise her basic policy on fishing on the high seas and should participate actively in international treaties, and thereby seek greater recognition of her vested fishing rights.

Japan (Contd.):

SHRIMP IMPORT TRENDS:

Japan annually imports about 12,000-13,000 metric tons of frozen shrimp. Of that amount, approximately 40 percent is supplied by Mexico.

Japanese shrimp importers are disturbed over the occurrence of false labeling of frozen shrimp imported from Mexico. Unless the situation is remedied, they are said to be contemplating placing a voluntary ban on the purchase of Mexican frozen shrimp handled by certain United States trading firms. According to the Japanese firms, the deliveries of frozen shrimp often did not conform to their order specifications, although the labeling on the packages seemingly indicated that they did. For example, the contents of packages marked as white shrimp were, in fact, brown and sizes were smaller than those indicated on the packages. (Minato Shimbun, May 23, 1964.)

1964 FROZEN OYSTER PACK FOR EXPORT TO UNITED STATES:

A total of 180 metric tons of frozen oysters for export to the United States was packed in the first quarter of this year by a leading Japanese fishery firm. In 1963, a total of 350 tons of Japanese frozen oysters was exported to the United States, 250 tons of which are reported sold.

The composition of this year's Japanese frozen oyster pack by type of pack is: 40 tons tray-packed; 120 tons individually quick-frozen (bulk) packed; 20 tons block-packed.

The sale of frozen oysters in Japan has increased as a result of the Japanese firm's accelerated home sales campaign. (Shellfish Soundings, May 14, 1964.)

FISH MEAL PRICES:

The Japanese firms operating fish meal factoryships in the Eastern Bering Sea are hopeful of receiving 62,000 yen (US\$172) a metric ton for their 1964 production of fish meal on the domestic market. Fish meal consumer organizations in Japan are countering with a price offer of 57,000 yen (US\$158) a ton.

Five Japanese factoryships are engaged in the production of fish meal in the Eastern Bering Sea this year. Their total production target amounts to slightly over 40,000 tons. (Suisan Keizai Shimbun, May 17, 1964.)

MARINE OIL SUPPLY AND DISPOSITION, 1962-1963 AND 1964 FORECAST:

Edible Marine Oil: Japanese production of edible marine oils in calendar year 1963 was down about 10 percent from that in the previous year due mainly to lower production of fish oil. Edible whale oil production in 1963 was down only 3 percent, but Japanese production of whale oil was expected to show a considerable decline in 1964 and exports of edible marine oil are also expected to decline in 1964.

Table 1 - Japanese Supply and Disposition of Edible Marine Oils, 1962-1963 and 1964 Forecast

Item	Calendar Years		
	Forecast 1964	1963	1962
... (Metric Tons) ...			
<u>Supply:</u>			
<u>Opening stocks:</u>			
Fish oil and fish liver oil	9,854	18,475	10,342
Whale oil	5,923	5,114	6,235
Total opening stocks, January 1	15,777	23,589	16,577
<u>Production:</u>			
Whale oil	99,000	127,000	130,467
Fish oil	32,200	24,700	39,780
Cod-liver oil	7,800	7,300	7,771
Shark-liver oil	1,800	1,500	1,201
Other fish-liver oil	800	600	717
Total production	141,600	161,100	179,936
Imports	1,000	500	1,167
Total supply	158,377	185,189	197,680
<u>Disposition:</u>			
Exports	103,700	119,257	94,355
Domestic disappearance	1/	1/	1/

1/ Data not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic food uses of marine oils in fiscal year 1964 amounted to 52,500 tons--17,400 tons whale oil and 35,100 tons fish oil--all of which was consumed in the manufacture of margarine and shortening. In addition, 5,500 tons of fish oil was consumed for nonfood uses.)

Inedible Marine Oil: Japanese production of inedible marine oil (sperm oil) in 1963 was up 12 percent from the previous year. Production and exports of sperm oil are expected to increase in 1964.

Foreign Trade in Edible and Inedible Marine Oil: IMPORTS: Japanese imports of marine oil are small and consist mainly of edible fish oil and shark-liver oil. Total imports of edible and inedible marine oils in 1963 were

Japan (Contd.):

Table 2 - Japanese Supply and Disposition of Inedible Marine Oil (Sperm Oil)^{1/}, 1962-1963 and 1964 Forecast

Item	Calendar Years		
	Forecast 1964	1963	1962
	... (Metric Tons) ...		
Supply:			
Opening stocks, January 12/	7,332	6,509	6,785
Production	42,100	37,800	33,870
Imports	-	7	-
Total supply	49,432	44,316	40,655
Disposition:			
Exports ^{3/}	20,100	12,500	13,700
Domestic disappearance	4/	4/	4/

- 1/The Japanese supply of inedible marine oil consists of sperm oil.
 2/Stocks held by oil processors.
 3/Estimated by the Japanese Ministry of Agriculture and Forestry. The estimated exports of sperm oil are less than those shown in table 4. The exports of sperm oil shown in table 4 appear to include direct exports by fishing fleets.
 4/Data not available. (The Japanese Ministry of Agriculture and Forestry estimated that domestic nonfood uses of sperm oil in fiscal year 1964 amounted to 22,000 tons.)

Table 3 - Japanese Imports of Marine Oils by Country of Origin, 1962 and 1963

Commodity and Country of Origin	1963	1962
	... (Metric Tons) ...	
Edible Marine Oil:		
Cod-liver oil:		
Republic of Korea	-	83
Other countries	7	-
Total cod-liver oil	7	83
Shark-liver oil:		
Republic of Korea	-	56
Republic of China	76	110
Norway	49	65
United States	-	19
Other Countries	24	17
Total shark-liver oil	149	267
Fish-liver oil:		
Republic of Korea	-	18
Communist China	9	13
Republic of China	32	9
Hong Kong	21	28
United States	0	10
Other Countries	-	9
Total fish-liver oil	62	87
Fish oil:		
Peru	271	30
Angola	-	640
South Africa	1	-
Total fish oil	272	670
Whale oil:		
Ryukyu Islands	-	60
United States	10	-
Total whale oil	10	60
Total edible marine oils	500	1,167
Inedible Marine Oil:		
Sperm oil:		
United States	7	0
Total edible and inedible marine oils	507	1,167

Source: Japanese Customs Bureau, Ministry of Finance.

Table 4 - Japanese Exports of Marine Oils, by Country of Destination, 1962 and 1963

Commodity and Country	1963	1962
	... (Metric Tons) ...	
Edible Marine Oils:		
Whale oil:		
Republic of Korea	-	544
North Korea	226	-
Communist China	-	1,016
Philippines	-	6
Sweden	-	3,302
United Kingdom	27,880	24,872
Netherlands	54,690	44,644
Belgium	5,080	-
France	13,564	-
West Germany	15,685	16,325
United States	-	730
Australia	301	-
Total whale oil	117,426	91,439
Cod-liver oil:		
Malaysia	134	40
Philippines	13	20
Canada	113	139
United States	748	744
Other countries	54	20
Total fish oil	1,062	963
Shark-liver oil:		
United States	5	47
Other countries	12	63
Total shark-liver oil	17	110
Other fish-liver oil:		
Norway	33	52
Sweden	27	126
United Kingdom	38	124
Netherlands	59	120
Belgium	39	40
France	26	106
Canada	27	76
United States	293	334
Australia	5	77
Other countries	60	81
Total other fish-liver oils	607	1,136
Fish oil:		
Republic of Korea	90	30
Republic of China	-	94
Malaysia	-	20
United States	-	518
Other countries	24	8
Total fish oil	114	670
Unclassified marine oil:		
All countries	31	37
Total edible marine oils	119,257	94,355
Inedible Marine Oil:		
Sperm oil:		
Republic of Korea	-	37
Republic of China	17	19
United Kingdom	3,853	9,779
Netherlands	39,550	4,573
Belgium	-	3,302
West Germany	2,302	8,407
United States	7,532	14,381
Australia	304	-
Other countries	2	-
Total sperm oil	153,560	140,498
Total edible and inedible marine oils	172,817	134,853

1/Totals exceed estimated total exports of sperm oil shown in table 2.
 Source: Japanese Customs Bureau, Ministry of Finance.

Japan (Contd.):

down 57 percent from those in 1962 due mainly to smaller shipments from Angola and the Republic of Korea.

EXPORTS: Japanese exports of edible marine oils in 1963 were up 26 percent from those in the previous year due to larger shipments of whale oil which accounts for the bulk of Japanese edible marine oil exports. The leading buyers are the Netherlands, United Kingdom, France, and West Germany.

Exports of inedible sperm oil (as reported by the Japanese Customs Bureau) were also up in 1963 due mainly to larger shipments to the Netherlands.

Note: See Commercial Fisheries Review, July 1963 p. 83.

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JAPANESE MAY PURCHASE DUTCH WHALING FACTORYSHIP:

The three large Japanese fishing companies engaged in whaling in the Antarctic Ocean will likely sign an agreement to purchase the Netherlands Whaling Company's whaling factoryship Willem Barendsz (26,830 gross tons), including that factoryship's six-percent international whale-catch quota. The purchase was to be made after the June 1964 International Whaling Conference, according to informed industry sources. In January 1964 the President of the Netherlands Whaling Company had offered to sell its factoryship to Japan. However, the Japanese firms, after meeting with the Fisheries Agency, decided at that time not to commit themselves on the offer until after the June conference. (Suisan Keizai Shimbun, May 14, 1964.)



Mexico

SHRIMP VESSELS BUILT FOR KUWAIT:

Mexico is becoming an important factor in supplying foreign fisheries with shrimp vessels. A shrimp vessel built in Mexico has been operating successfully off Pakistan, and a shipyard on the Pacific coast of Mexico has received orders for the construction of twelve 67-foot steel shrimp vessels for Kuwait. Orders have also been received from Brazil and Chile.

Four of the shrimp vessels for Kuwait were completed in May 1964 and the other 8 are



Fig. 1 - Steel shrimp trawler (67 feet) under construction at a shipyard in Mazatlan, Mexico, for export to Kuwait.

nearing completion. The vessels are being delivered ready to fish and are fully equipped with nets, radio, direction finder, echo-sounder, brine refrigeration equipment, and fiberglass skiffs. The machinery and most of the electronics equipment installed were manufactured in the United States, although Japanese echo-sounders have been used. The vessels are equipped with special machines to sort shrimp by size.

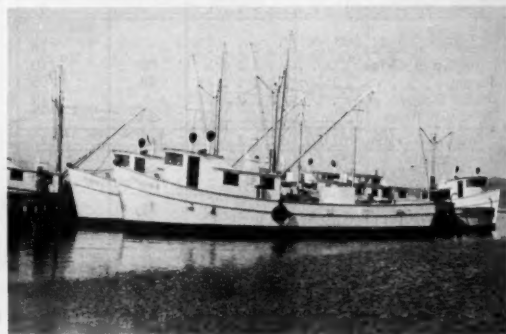


Fig. 2 - Several of the 12 steel shrimp vessels built for Kuwait. Four were ready to ship in 10 days.

Designed for operation in the tropics, the vessels have been built to identical specifications to facilitate maintenance in remote areas. They are designed to carry a crew of 25, about twice the size of Mexican crews on comparable vessels.

The new vessels will be delivered to Kuwait by freighter. They will be accompanied by experienced 3-man Mexican crews--captain, engineer, and seamen--who will remain with the vessels under 18-months contracts

Mexico (Contd.):



Fig. 3 - Steel shrimp vessels ready to leave for Kuwait, fully equipped and ready to fish. Mexican captain, engineers, and 1 crewman for each vessel are provided on an 18-months contract.

to train Kuwait fishermen. (United States Embassy, Mexico, D.F., June 1, 1964.)

SECONDARY FISHERIES OF SINALOA:

The Mexican state of Sinaloa and its principal fishing port Mazatlan on the Gulf of California are known throughout the fishing world for their shrimp industry. However, some of the lesser known fisheries in the area are also of interest. Those include, among others, the sport fishery, a canoe fishery, a sea turtle fishery, and a shark fishery.



Fig. 1 - Part of the 270-vessel shrimp fleet fishing out of Sinaloa's principal fishing port of Mazatlan.

Mazatlan Sport Fishery: Excellent fishing for marlin and sailfish is the lure that brings many tourists to Mazatlan. A fleet of about

40 sport fishing charter vessels operates out of Mazatlan for large game fish. Daily charter rates range from US\$50 to \$65 during the season from November through May and about \$40 during the remainder of the year. Rates include tackle and bait as well as the services of the skipper and a deckhand for 2 to 3 sport fishermen. The rate for longer trips to offshore islands is about \$120 per day. Part-day trips for numerous smaller game fish are \$6 per hour.



Fig. 2 - Mazatlan as seen by a returning shrimp vessel.

The season for striped marlin, which is the principal game fish, is from January into May. Sailfish are available from early May to November. The large black marlin are taken in May, June, and July. At times, all three varieties are caught in a single day.

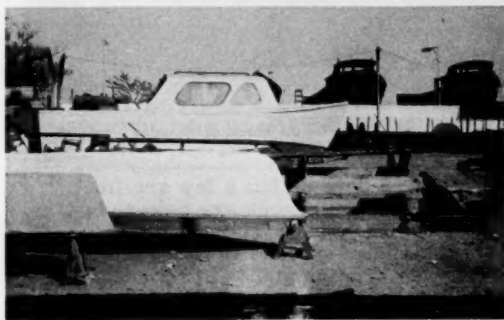


Fig. 3 - Fiberglass charter sport fishing boat being built in a shipyard in Mazatlan. Steel shrimp vessels can be seen in background.

When all 40 charter sport vessels are fishing, which is a frequent occurrence, the total gross daily income for charters runs from \$1,600 to \$2,400. In addition, other craft fishing for the smaller game fish also bring in a sizable income. The Mazatlan sport fishery provides a livelihood for some 80 to 100 crewmen and 40 employees of the landing wharfs for the sport fleet. It also helps support the fishermen who catch mullet for bait, and brings additional income to boatyards and suppliers.

Mexico (Contd.):

The total Mazatlan sports catch of marlin and sailfish amounts to over 5,000 fish a year. Virtually all of those are given by the anglers to the crew for sale at extremely low prices for the manufacture of fish meal. Realizing that marlin taken in the Japanese tuna fishery are used for fish sausages, the Mexican Department of Fisheries is seeking ways to use the sport-caught fish in its program to increase the consumption of fishery products.

Mazatlan Canoe Fishery: In picturesque contrast to Mazatlan's modern fleet of shrimp trawlers and shrimp processing plants, is the fleet of dugout canoes that calls the beach in front of luxurious resort hotels its home port. The canoe fleet consists of about 100 craft.



Fig. 4 - Hand-line canoes on the beach at Mazatlan--fish for sierra, snapper, corvina, cabrilla, etc.

Nearly all are dugouts but a few are fiberglass. Most of the canoes are powered by small inboard engines. The canoes, manned by 1 or 2 fishermen, usually fish within sight of the beach. Their catches are made with hook and line, and include sierra, corvina, cabrilla, and snapper. Some of the catch is purchased by local buyers for retail markets and hotels, but much of the catch is shipped by truck to Mexico City and Guadalajara.

Sea Turtle Fishery: One of the cooperatives in Sinaloa maintains a sea turtle fishery. During April 1964, a sea turtle catch of over 30 tons was taken by the cooperative. The sea turtles, known as caguama or cahuama, provide both leather and meat. The leather is used for luxury products. The meat is consumed locally to a large extent. The flipper meat is used in a soup that is a favorite dish of Mazatlan.

The director of the Mazatlan Biological Station of the Mexican Department of Fisheries has stated that the sea turtle resource is rather limited and under constant threat from unauthorized egg gathering on the beaches. (Sea turtles go ashore to deposit their eggs.) Nevertheless, if supervised carefully, the fishery could probably be expanded somewhat.

Shark Fishery at Teacapan: The village of Teacapan at the Southern tip of Sinaloa is known for its shrimp and oysters. From mid-September to early December the town is bustling with activity as close to 1,000 local canoes are busy producing shrimp for the canneries and freezing plant in nearby Escuinapa. During other seasons, the fishermen are employed in the oyster fishery, the tourist sport fishery, and the shark fishery. The Teacapan shark fishery does not compare with the modern large-scale shark fisheries operating at Mazatlan, Islas Tres Marias, and Zihuatanejo. But the Teacapan operation is typical of the small shark fisheries at dozens of remote villages all along the coast.



Fig. 5 - Right of center is a shark fishing boat, Teacapan, Sinaloa.

A few small power boats operate in the ocean waters near the Teacapan lagoon, landing shark catches on the sandy beach at the village. The



Fig. 6 - Butchering 4 large sharks on the beach at Teacapan.

Mexico (Contd.):

sharks are dressed on the beach and the fillets are washed in the lagoon. The meat is salted and sun-dried on racks. The resulting product is said to be similar to dry-salted



Fig. 7 - After the shark fillets are washed, they are put on racks to dry. The product is sold as "bacalao de tiburón." In left foreground, shark fins are on the racks to dry.

cod. In fact, it is called "bacalao de tiburón" or codfish-style shark. The product is shipped to the cities for sale by the National Company of Popular Subsistence (CONASUPO) to limited-income groups. It is also sold in the markets. CONASUPO has prepared a pamphlet of recipes that features "bacalao de tiburón." The shark fins are similarly dried for use in soup. Mexican exports of dried shark fins (mainly to the United States) amount to about 70,000 pounds annually, valued at \$28,000. (Fisheries Attache, United States Embassy, Mexico, D.F., June 1, 1964.)



Netherlands

FISH MEAL PRICES, 1962-1963:

During January-September 1963, fish meal prices in the Netherlands averaged lower than those in the same period of 1962; but in the final quarter of 1963 an upward trend carried Dutch fish meal prices above those in the last

Average Monthly Prices ^{1/} of Fish Meal in the Netherlands, 1962-1963				
Month	1963		1962	
	Guilders/ Metric Ton	US\$/ Short Ton	Guilders/ Metric Ton	US\$/ Short Ton
January . . .	547	137.6	578	145.4
February . . .	546	137.4	560	140.9
March . . .	529	133.1	542	136.3
April . . .	522	131.3	540	135.8
May . . .	513	129.1	543	136.6
June . . .	513	129.1	528	132.8
July . . .	508	127.8	520	130.8
August . . .	502	126.3	508	127.8
September . .	505	127.0	517	130.1
October . . .	535	134.6	518	130.3
November . .	542	136.3	539	135.6
December . .	579	145.7	552	138.9

^{1/}Brokers' prices to users for 61.4 percent protein meal.

Source: Netherlands Central Bureau of Statistics.

quarter of 1962. (United States Embassy, The Hague, April 24, 1964.)

* * * * *

MARINE OIL SUPPLY AND DISPOSITION, 1963 WITH COMPARISONS:

Supply and Disposition: In 1963, there was an increase of about 56 percent in domestic production of marine oils in the Netherlands, although imports continued to provide the bulk of the total supply. Domestic use absorbed 73 percent of that supply, 8 percent was exported, and 19 percent was carried over on December 31, 1963.

Table 1 - Netherlands Supply and Disposition of Marine Oils, 1963

Item	1953
	Metric Tons
Supply:	
Opening stocks, January 1	18,306
Imports	1/95,500
Production^{2/}:	
Whale oil	8,130
Other marine oils	3,654
Total production	11,784
Total supply	125,590
Disposition:	
Exports^{3/}:	
As oils	5,967
As oil in products	4,600
Total exports	10,567
Domestic disappearance:	
Food use	82,466
Other use	8,868
Total domestic disappearance	91,334
Closing stocks, December 31	23,689

^{1/}Does not completely agree with data reported in table 2.

^{2/}Production entirely from Dutch raw material.

^{3/}Does not include fish-liver oil.

Source: Estimates based on preliminary data issued by the Netherlands Product Board for Margarine, Fats, and Oils.

Netherlands (Contd.):

Table 2 - Netherlands Imports of Fish and Marine-Animal Oils, 1962-1963

Commodity and Origin	1963			1962		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Guilders	US\$1,000	Metric Tons	1,000 Guilders	US\$1,000
Fish-Liver Oil:						
European Economic Community	337	205	57	379	190	53
Iceland	29	19	5	150	62	17
Norway	311	352	98	303	298	83
Portugal	554	359	99	25	16	4
Japan	59	389	108	123	732	203
Other countries	59	67	19	48	50	14
Total fish-liver oil	1,349	1,391	386	1,028	1,348	374
Fish Oil:						
European Economic Community	2,171	884	245	2,265	841	233
Iceland	1,235	681	189	429	144	40
United States	17,398	10,040	2,784	14,999	5,531	1,534
Peru	33,706	12,796	3,548	18,560	6,536	1,812
Chile	7,501	3,300	915	5,632	1,884	523
Other countries	1,067	581	161	965	372	103
Total fish oil	63,078	28,282	7,842	42,850	15,308	4,245
Whale Oil:						
Iceland	-	-	-	1,016	713	198
Norway	9,481	5,048	1,400	1,480	809	224
Japan	12,381	6,567	1,821	10,177	5,612	1,556
Other countries	770	349	97	1	1	1/
Sea deliveries/	3,824	2,458	682	21,453	10,089	2,798
Total whale oil	26,456	14,422	4,000	34,127	17,224	4,776
Other Fats from Marine Products:						
Norway	114	98	27	105	108	30
Portugal	488	392	109	265	216	60
United States	1,241	779	216	934	601	167
Peru	-	-	-	644	487	135
Japan	66	59	16	178	140	39
Other countries	37	40	11	47	56	15
Total other marine fats	1,946	1,368	379	2,173	1,608	446
Total imports of marine oils	92,829	45,463	12,607	80,178	35,488	9,841

1/Less than \$500.

2/From whale oil production vessels other than those in Dutch fleets.

Source: Netherlands Central Bureau of Statistics.

Table 3 - Netherlands Exports of Fish and Marine-Animal Oils, 1962-1963

Commodity and Destination	1963			1962		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Guilders	US\$1,000	Metric Tons	1,000 Guilders	US\$1,000
Fish-Liver Oil:						
European Economic Community	112	89	25	279	139	39
Other countries	17	18	5	30	30	8
Total fish-liver oil	129	107	30	307	169	47
Fish Oil:						
European Economic Community	2,236	1,135	315	1,881	772	214
Sweden	-	-	-	98	49	14
Other countries	142	60	16	76	43	12
Total fish oil	2,378	1,195	331	2,055	864	240
Whale Oil:						
European Economic Community	301	174	48	5,144	3,919	1,087
Norway	266	107	30	-	-	-
Other countries	8	1	1/	15	9	2
Total whale oil	575	282	78	5,159	3,928	1,089
Other Fats from Marine Products:						
European Economic Community	58	46	13	1,157	927	257
United States	2,951	2,361	655	305	244	68
Other countries	5	5	1	15	18	5
Total other marine fats	3,014	2,412	669	1,477	1,189	330
Total exports of marine oils	6,096	3,996	1,108	8,998	6,150	1,706

1/Less than US\$500.

Source: Netherlands Central Bureau of Statistics.

Netherlands (Contd.):

Imports: Total imports of marine oils by the Netherlands in 1963 were up 16 percent in quantity and 28 percent in value from those in the previous year due mainly to larger shipments of fish oil from Peru, the United States, and Chile. The gain was partly offset by a decline in total whale oil imports which were reduced by a drop in direct deliveries by foreign fishing fleets. (Imports of whale oil from Norway were substantially higher in 1963.) With a decline in world production of whale oil in 1963, whale oil prices at Rotterdam showed a substantial gain (table 4).

Table 4 - Wholesale Price of Whale Oil, c.i.f. Rotterdam, at Selected Intervals, 1962-1963

Month ^{1/}	1963		1962	
	Guilders/ 100 Kilos	U.S. Cents/ Pound	Guilders/ 100 Kilos	U.S. Cents/ Pound
March . .	64.5	8.1	51.1	6.4
June . . .	74.3	9.3	48.7	6.1
September	79.5	10.0	45.7	5.7
December	81.8	10.3	42.0	5.3

^{1/}Mid-month prices.

Source: Netherlands Ministry of Agriculture.

Exports: Total exports of marine oils from the Netherlands in 1963 were down 32 percent in quantity and 35 percent in value from those in 1962 due to a sharp drop in shipments of whale oil. The European Economic Community (EEC) was the leading buyer of all types of Dutch marine oil in 1962. In 1963, the EEC continued to be the leading market for Dutch fish oil, but the United States replaced the EEC as the main market for processed fats from marine oils. (United States Embassy, The Hague, April 24, 1964.)

Notes: (1) Netherlands guilder 3.606 equals US\$1.00.

(2) See *Commercial Fisheries Review*, July 1964 p. 69, Dec. 1963 p. 74, Jan. 1963 p. 106.



Netherlands West Indies

SIX TUNA ICE VESSELS ASSIGNED TO NETHERLANDS WEST INDIES BASE:

One of the larger Japanese fishing firms contracted for six tuna ice vessels (ranging in size from 99 to 190 gross tons) to fish out of its base at Saint Martin, Netherlands West Indies. The Saint Martin base has a 2,000-ton fresh tuna export quota.

That firm had about 35 tuna vessels fishing for it in the Atlantic Ocean in 1963, and handled about 20,000 metric tons of Atlantic



Ocean-caught tuna. Of that amount, 90 percent was exported. (*Suisancho Nippo*, June 4, and May 30, 1964.)



Norway

LOFOTEN COD FISHERY DISAPPOINTING IN 1964:

Total landings from the 1964 Norwegian Lofoten cod fishery amounted to only 23,700 metric tons at the close of the season April



Shows a Norwegian line-fishing boat boating cod.

Norway (Contd.):

20. That was a decline of 4,600 tons from the catch in 1963, and the second lowest catch since World War II. Most of the fishermen who participated in the Lofoten cod fishery in 1964 will be eligible for State aid under the Act of Minimum Shares which guarantees fishermen a minimum weekly income.

The Lofoten area is in the path of spawning cod passing from the Barents Sea to the coast of Norway. During the last 8 years, the total annual Norwegian catch of spawning cod along the entire coast from Møre to Finmark (including the Lofoten area) has been reduced by about 50 percent to 49,200 tons in 1964. According to statements made by several representatives of the fishermen, the downward trend in the cod catch off the coast of Norway is mainly due to overfishing of stocks in the Barents Sea. (United States Embassy, Oslo, May 17, 1964.)

IMPROVED ECHO-SOUNDER OFFERED BY NORWEGIAN FIRM:

A sonar device with a range of 6,500 feet in any direction (twice the range of conventional sonars) has been introduced by an electronics firm in Norway. The company claims the new instrument can determine the location and direction of fish schools with accuracy. It was designed specifically to meet the needs of Norwegian herring fishermen, but can be used in other fisheries. It can be operated automatically or by push-button control, and can be installed in vessels as small as 70 feet. (*News of Norway*, May 28, 1964.)

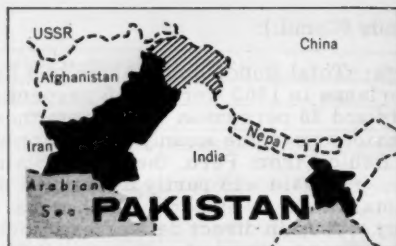


Pakistan

SHRIMP PROCESSING CAPACITY OF PLANTS IN KARACHI:

A total of 14 shrimp freezing and processing plants (2 more than in 1962) are located in Karachi, Pakistan, each with an average daily capacity of 10 metric tons. When operating six days a week, their combined annual capacity has a potential of about 42,000 tons. In 1963, however, only 18,400 tons of shrimp were landed for the use of those plants.

A new shrimp freezing plant on the Mekran coast at Gwadar which was to have opened



in 1963 was not yet in operation, according to latest reports. (United States Embassy, Karachi, May 15, 1964.)



Peru

FISH MEAL PRODUCTION AND EXPORTS, JANUARY-APRIL 1964:

Peruvian fish meal production in January-April 1964 was reported to be 655,000 metric tons, or 48 percent more than the 443,300 tons produced during the same period of 1963.



Anchovetas going to plant--Chimbote. Conveyor at Star Kist plant in operation.

Peruvian fish meal exports during the first 4 months of 1964 amounted to 531,000 tons, an increase of 18 percent from the 451,000 tons exported during the same period of 1963. (Unpublished sources.)

Peru (Contd.):

FISH MEAL EXPORT FORECAST FOR 1964:

Authoritative industry sources predict total Peruvian fish meal exports in 1964 will reach 1.2 million metric tons, a considerable increase over the 1.04 million tons exported in 1963. Based on available data for the first quarter, prospects for record output and exports look favorable. In the first 3 months of 1964, production totaled almost 500,000 tons, up more than 50 percent from the corresponding period a year ago when output was cut by a labor dispute. Exports for the first quarter of 1964 (amounting to 389,000 tons) reflect an increase of approximately 10 percent over January-March 1963, despite a port strike in February 1964 which held export volume down. Inventories at the end of March 1964 were higher than a year earlier so, on the basis of continued good demand, last year's export record should be surpassed.

(Editor's note: In late May 1964, Peruvian fish meal prices were reported as US\$123-125 per ton (65 percent protein meal) f.o.b. United States East Coast and Gulf ports as against comparable prices of \$117-119 per ton in late May 1963.)

Rapid expansion of the Peruvian fish meal industry during the past two years coupled with spotty fishing in some ports has brought on a financial crisis. But production continues high in spite of the closing of some 30 plants (most of those marginal) over the past 4 months. Heavy production is expected to continue, unless there is a disappearance of fish or a break in the market price. The Peruvian Government is expected to offer some form of tax relief in the near future that will enable efficient operators to survive. (United States Embassy, Lima, May 12, 1964.)

MARINE OIL SUPPLY AND DISPOSITION, 1961-1963 AND 1964 FORECAST:

Fish Oil: Peruvian production and exports of fish oil declined in 1963 after a sharp increase during the 1960-1962 period, according to estimates by the Peruvian industry. Greatly improved extraction processes helped boost Peruvian fish oil production to a record level in 1962. The anchoveta catch is the mainstay of the Peruvian reduction industry and domestic production of fish oil is the

main factor in the Peruvian marine oil supply. Imports are small.

Estimates indicate that Peruvian stocks of fish oil were at a low level at the beginning of 1964. Production of fish oil in 1964 is expected to continue at about the same level as in 1963, although exports may be somewhat lower in 1964.

Peruvian Supply and Disposition of Fish Oil, 1961-1963 and 1964 Forecast				
	Forecast 1964	1/ 1963	1962	1961
	..... (Metric Tons)			
Supply:				
Opening stocks, Jan. 1	1,000	5,000	12,500	6,000
Production ^{2/}	120,000	120,000	155,000	118,886
Imports	3/	3/	3/	3/
Total supply	121,000	125,000	167,500	124,886
Disposition:				
Exports ^{4/}	103,500	110,035	150,596	102,306
Domestic disappearance:				
Apparent edible consumption ^{5/}	6,000	5,000	4,000	3,300
Estimated industrial consumption ^{5/}	10,000	8,965	7,904	6,780
Closing stocks, Dec. 31	1,500	1,000	5,000	12,500
^{1/} Preliminary. ^{2/} Reported by Peruvian National Fisheries Society. ^{3/} Complete data not available on Peruvian imports; however, imports are relatively insignificant. (The Callao Customs-house reported Peruvian imports of inedible fish oil in 1963 as 363 tons of hydrogenated fats and oils and 79 tons of cod-liver oil.) ^{4/} Estimates by Peruvian industry. Data include fish oil for both edible and inedible purposes. Data may not agree with export data reported by other sources. ^{5/} Estimates from unpublished sources. Note: The table does not include data on the supply and disposition of whale and sperm oil.				

Whale and Sperm Oil: Peruvian exports of sperm oil amounted to 9,079 metric tons valued at \$34.6 million (US\$1.3 million) in 1963 as compared with 9,336 tons valued at \$34.5 million (US\$1.3 million) in 1962, according to data from the Peruvian Customs Office. Exports of refined whale oil amounted to 400 tons valued at \$901,000 (US\$33,600) in 1963. There were no registered exports of whale oil in 1962. (United States Embassy, Lima, April 28, 1964.)

Note: See Commercial Fisheries Review, Feb. 1964 p. 79, and June 1963 p. 86.

**Philippines****GOVERNMENT OPENED ANOTHER BID ON IMPORTED CANNED SARDINES:**

The Philippine National Marketing Corporation (NAMARCO) opened another bid on June 2,

Philippines (Contd.):

1964, for 499,800 cases of canned sardines. The bid carried the provision that 245,000 cases be already packed and ready for delivery, and the remainder of 254,800 cases subject to pack. Two of the bidders represented United States suppliers, one a British supplier, and 7 bidders represented South African suppliers.

The bid offered by the United States Supplier was for 50,000 cases of 1-pound ovals at US\$9.22 a case (48 cans per case) and 6,000 cases of 1-pound tallies at \$6.48 a case (48 cans per case). South African case (48 cans) prices on the same quantity were \$8.00 for ovals and \$6.15 for tallies. The British offer was for 60,000 cases (95 cans) of "jitneys" (5-ounce) at \$7.45 and the South African bid for the same was \$7.15 a case. NAMARCO indicated that it probably would reject the United States and British bids in favor of the lower-priced South African product because the Government justified imports from South Africa on the basis of cheaper food for the consumer.

Bids on the 254,800 cases subject to pack were all from South African suppliers. NAMARCO indicated that if it could obtain firm offers of sardines already packed it might reject the South African bids on that quantity. (United States Embassy, Manila, June 11, 1964.)



South Africa Republic

FISHING VESSEL MAKES REMARKABLY GOOD ANCHOVY CATCHES:

Large catches of anchovy were made in April 1964 by the 67-foot pilchard vessel Silver Bonito which fishes out of St. Helena Bay in South Africa.

On April 9, the Silver Bonito caught 70 short tons of anchovy in one set of the net; on April 10 she returned at 2 p.m., after having left the dock at 9 a.m. the same day with 140 tons which were caught in two sets; on the morning of April 13, after being out for the night, she returned with 120 tons and the same evening caught a further 70 tons.

The catches were made about two hours' sailing time from the fishing company's fac-

tory. At the factory, the anchovies were processed for fish meal in the same way as the pilchard catches. The fish meal was of the same quality as that obtained from pilchards but slightly darker. The oil yield was good.

The Silver Bonito is equipped with one of the six $\frac{1}{2}$ -inch mesh anchovy nets in use in that industry for experimental purposes. The net had been remodeled, after previous use, to the specifications of the fishing company. (The South African Shipping News and Fishing Industry Review, April 1964.)



South-West Africa

PILCHARD SEASON AT WALVIS BAY GETS UNDER WAY:

The 1964 pilchard fishing season at Walvis Bay in South-West Africa started on February 16, 1964 when two factories sent their vessels out for the first time. The pilchards were being found in reasonable quantities about an hour's sailing from Pelican Point. The condition of the fish was described as "good for the time of the year" and the early oil yield has been about 10 gallons a ton.

The other four factories in Walvis Bay were to start during the second half of February.

This year the factories will be concentrating on the production of fish meal and fish body oil for which there are ready markets. The canning program will again, as in 1963, be cut back. Each factory is limited to a ceiling catch of 90,000 tons, but this could be increased by the South-West Africa Administration if the markets for the finished product and the availability of fish warrant it.

By the last week of February, all six of the pilchard-processing factories at Walvis Bay were in operation. The seventh



South-West Africa (Contd.):

factory (which was being built) was expected to start operating early in June.

The first fish meal shipment of the 1964 season's output was expected to have been shipped early in April. All remaining fish meal on hand from last year has been shipped out.

Although the fish were rather far out (5 to 8 hours' sailing) they were reported to be in excellent condition. By the second week of March the oil yield had risen to nearly 18 gallons per ton of fish.

Three of the factories started canning on a small scale during the second week of March, but the fish were found to be a little soft for full-scale operations. Other factories were expected to start during that month.

The latest market prospects for this season's Walvis Bay pilchard production are:

Fish Meal: Practically the entire Walvis Bay production for this year has been sold at what is described as a good price.

Fish Body Oil: As of April the market appeared good. As was the case last year, purchases were being made in lots. Shipments will go forward according to purchases during the year.

Canned Fish: There is little change in the marketing of this product and production will be low compared with previous years. As the Marine Products Group has now placed sales in the hands of Federal Fish Packers, which has been reconstituted as Federal Marine Ltd., all canned fish packed in Walvis Bay will now be marketed through that organization. (The South African Shipping News and Fishing Industry Review, March and April 1964.)



Spain

FISHERY TRENDS AT VIGO,
JANUARY-MARCH 1964:

Landings and Prices: Fishery landings at the port of Vigo, Spain, in January-March 1964 totaled 15,672 metric tons valued at 229.5 million pesetas (US\$3.8 million), a decline of 23.9 percent in quantity and 14.5 percent in value from the fourth quarter 1963 landings but only slightly more than landings in January-March 1963. The value of the first quarter 1964 landings, however, was 16

percent below that in the corresponding period of 1963.

Landings of frozen fish at Vigo (part of which is imported fish) were not included in the quarterly landings data in the past but are included for 1964. There is an increasing trend toward freezer vessels, which were first put in operation in 1961 by a local fishery firm. That firm has plans for a fleet of 21 vessels, including two transports and a factoryship. The firm's fishing fleet, which consisted of about 8 vessels in the first quarter of 1964, has been fishing off South and West Africa (to a lesser extent off South America). Those vessels are expected to land about 20,000 metric tons of frozen fish at Vigo in 1964. Other local fishing companies are following the same example on a more modest basis. Frozen fish landings at Vigo during January-March 1964 totaled 3,686 tons--mostly hake and small hake.

Canned Fish Industry: Canned fish production was light during January-March 1964, with industry continuing to feel the effects of marketing difficulties which carried over from 1963 due, in part, to the decline in canned fish exports. Most canneries reported higher stocks than normal for this time of the year and anticipated increased difficulties with the beginning of the sardine fishing season in April and the albacore season in June.

Cannery production costs were reported considerably higher in 1963 as a result of salary increases (a collective agreement late in 1962 and a further increase with the minimum wage law in January 1963) and the high price of oil, fish, and other raw materials.

There is considerable concern regarding competition in the export market and the domestic demand for canned fish is not strong enough to absorb a significant portion of the production. One remedy which was believed would improve the situation was the export of canned fish packed in peanut oil. This is

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, January-March 1964 with Comparisons

Species	1964			1963					
	January-March			October-December			January-March		
	Quantity	Avg. Price		Quantity	Avg. Price		Quantity	Avg. Price	
	Metric Tons	Pesetas/Kilo	U.S.¢/Lb.	Metric Tons	Pesetas/Kilo	U.S.¢/Lb.	Metric Tons	Pesetas/Kilo	U.S.¢/Lb.
Small hake . .	4,503	26.47	20.0	4,675	25.50	19.3	3,992	27.82	21.0
Home mackerel	1,934	4.69	3.5	3,034	4.14	3.1	1,388	8.32	6.3
Octopus . . .	906	7.09	5.4	357	7.41	5.6	2,109	6.81	5.2
Tuna	538	18.64	14.1	-	-	-	770	13.18	10.0
Hake	232	50.57	38.3	135	56.09	42.4	311	48.24	36.5

Spain (Contd.):

Table 2 - Distribution of the Fishery Landings at Vigo, January-March 1964 with Comparisons

Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, Drying, Fish Meal, etc.) and Local Consumption
1st Quarter 1964	11,139	890	3,643
4th Quarter 1963	12,020	5,364	3,215
1st Quarter 1963	9,338	1,573	4,721

now discounted because of the excellent olive crop and the expected drop in the price of olive oil. It was reported that the difference between the price of peanut oil and olive oil would not exceed one peseta (1.6 U. S. cents) a liter, and that it would hardly be reflected in the price of the canned product. (United States Consulate, Vigo, April 14, 1964.)

Note: See Commercial Fisheries Review, March 1964, p. 68.



Thailand

FISHERIES SURVEY PLANNED

The Fisheries Department of Thailand has announced plans for a survey of fishing grounds off Thailand. The survey vessel Dhanarajata is scheduled to arrive in Bangkok in mid-1964 to begin explorations in the Gulf of Thailand. After a few months work in the Gulf, during which the crew will become familiar with the vessel's equipment, the Dhanarajata is expected to transfer operations to the potentially more important Andaman Sea. Thailand has not previously engaged in intensive fishing operations in that area. The survey is designed to indicate the quantity and quality of available fish stocks, including tuna stocks. (United States Embassy, Bangkok, May 11, 1964.)



U. S. S. R.

FISHING FLEETS CLAIMED SEEKING FISH RATHER THAN PROFITS:

Soviet fishing fleets are working to supply their country with food; fishing operations need not be justified on an economic basis. That was indicated by a representative of the Soviet Embassy in London during a talk in Grimsby, England, March 31, 1964. The Soviet representative's remark was made in reply to a question as to whether Soviet fisheries were self-sustaining from a profit

standpoint. (Fish Trades Gazette, April 4, 1964.)

SOVIETS CLAIM MARINE GROUPS CAN BE IDENTIFIED BY SOUND WAVES:

A classification of marine specimens according to ability to reflect acoustic waves has been reported by Soviet scientists. They state that probing of the Atlantic with sound waves has revealed four types of marine life which can be identified in schools by different degrees of scattering of sound.

The first group is composed of marine life 10 to 150 millimeters (0.39-5.91 inches) in diameter and lacking a solid skeleton or rigid shell (jellyfish and similar specimens) which are called semireflectors of sound.

A second group includes octopus which are denser and have a thin skeletal foundation. A still greater obstacle to sound is presented by the group of higher shellfish (crustaceans) covered with a hard dense shell. Finally, the Soviets report that a substantial effect of sound scattering is produced by fish. A particularly noticeable sound dispersal, in the range of several kilocycles at least, is said to be produced by fish possessing swimming bladders.

Soviet scientists state that the use of sound waves to locate schools of fish will make it possible to determine the size and in some cases even the species of fish. (The Fishing News, April 3, 1964.)



United Kingdom

FISH MARKETING INFORMATION SERVICE INTRODUCED BY WHITE FISH AUTHORITY:

The inauguration of a Fish Information Service was announced by the chairman of the British White Fish Authority in early May

United Kingdom (Contd.):

1964. The new service will make available to individual fish retailers the professional services of a shop design and improvement group. It will also provide advice on retailing methods and undertake promotional campaigns.

Introducing the new service, the chairman of the White Fish Authority pointed out that in recent years there have been drastic changes in almost every aspect of retailing, and a revolution in the housewife's method of shopping. The advent of the supermarket has had a great influence on shopping habits. The individual shopkeeper is, therefore, faced with the need for the highest degree of efficiency, and the modernization of his premises if he is to maintain his place in the market. Modern knowledge and ideas are being applied to the catching of fish; it is essential that attention should also be given to the manner in which the product is presented to the consumer. Furthermore, it should be stressed to the housewife that fish can be as important as meat in the daily diet. The aims of the Fish Information Service were described as, "The presentation of fish as a dish which is fashionable, satisfying, and convenient, from shops which embody the latest developments in retail design."

To achieve its purpose, the new Fish Information Service will perform three basic functions. First, it will provide a clearing house for information on the fish industry as a whole. Second, it will offer the industry a shop improvement service which will be aimed at helping the retailer to sell fish as the main family meal. And third, it will carry out an educational campaign to present to cookery students, catering establishments, restaurants, and the general public the message that fish is as suitable for the main dish as meat.

The chairman of the White Fish Authority said, "in short, the service forms part of the

overall campaign to present fish as 'the big dish.' Everyone knows the phrase 'Chips with everything.' Let us hope that before long there will be an equally well-known phrase--'Fish with everything'." (Fish Trades Gazette, May 2, 1946.)

VESSEL AND GEAR RESEARCH:

A representative of the British White Fish Authority in April 1964 described the work undertaken by the Authority's Industrial Development Unit at the port of Hull during the first year of the new unit's existence. He pointed out that the members of the unit had spent considerable time aboard trawlers at sea. If the design of the vessels is to be improved, performance under working conditions must be studied.

The unit made comprehensive measurements of the motions of trawlers in a seaway. The information obtained will help guide the design of improved echo-sounders and new refrigerating machinery, and the layout of galleys and accommodations in new stern-trawlers.

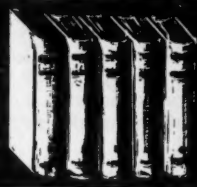
A study was made of the use and performance of the trawl winch aboard the freezer-trawler *Junella*. That led to recommendations which could significantly increase the earnings and reduce the costs of such vessels.

Other development projects being conducted include a wireless telemetry link from trawl to ship, to provide skippers with information about water temperature and the behavior of the trawl; a meter to inform the skipper about the tension in the trawl warps, in order to expedite shooting and hauling the net; new methods of fish stowage to avoid handling on discharge; washing and gutting machines; pneumatic transport of crushed ice; high-pressure hydrostatic power transmissions; and a stabilized narrow-beam echosounder. (Fish Trades Gazette, April 18, 1964.)





FEDERAL ACTIONS



Federal Trade Commission

BARS DISCRIMINATION IN RENTALS AND SALES OF SHRIMP PEELING MACHINERY:

On June 4, 1964, the Federal Trade Commission (FTC) ruled that officers and directors of two Louisiana corporations distributing shrimp peeling machinery have abused their patent rights in the shrimp processing machinery field. The FTC, therefore, issued an order barring certain discriminatory practices. The officers and directors of the firms concerned were ordered to: (1) stop discriminating among domestic shrimp producers in the rentals charged for their machines; and (2) offer their machines for sale to domestic canners at the same prices and under the same conditions and terms as are presently offered to foreign canners.

On the other hand, the FTC dismissed allegations that the shrimp peeling machinery patent holders had used various unlawful means to gain, perpetuate, or extend a monopoly position in the shrimp processing machinery field.

The FTC ruled that members of the family which are officers and directors of the Louisiana corporations involved have unlawfully abused their patent-based monopoly in the shrimp processing machinery field by (1) charging Northwest shrimp canner lessees of this indispensable machinery double the rate charged Gulf Coast canners, and (2) selling the machinery to foreign canners while refusing to sell and merely leasing it to competing domestic canners.

An order halting those illegal discriminatory practices was issued by the FTC against the four former copartners of the New Orleans firm marketing the machinery. That company was liquidated late last year and the four copartners now are the officers and directors of two successor corporations.

The Commission said in its opinion written by Commissioner Everette MacIntyre that respondents' patented shrimp processing machinery includes peelers, cleaners, separators, deveiners, and graders. The principal piece of machinery and the one developed first is the peeler, which was offered to Gulf Coast shrimp canners in 1949. Prior to its advent the canners depended on hand labor for peeling or picking their shrimp. Four peeling machines can approximately equal the output of 250 to 300 laborers. Consequently the peeler immediately made hand picking obsolete and became an absolute necessity. Within less than 10 years all the Gulf Coast canners had installed and were using respondents' peelers.

Prior to 1956 all shrimp canneries (except a single plant in Georgia which ceased production in 1961) were located on the Gulf Coast. In the early 1950's com-

mercially exploitable quantities of pandalid shrimp (smaller and having less meat yield than the penaeid variety found off the Gulf Coast) were discovered off the coasts of Washington and Oregon. In 1956 the first canning plant was started at Westport, Wash., and respondents leased a peeler to it. By September 30, 1959, their machines were operating in 12 Northwest canneries. West Coast canners are charged double the rental rate assessed Gulf Coast lessees. The reason for the differential, the respondents stated, is that the smaller West Coast shrimp have a count per pound approximately twice that of the Gulf Coast variety and the higher rate was fixed "... in order to adhere to our basic policy of charging a rate which was in proportion to the labor saved."

Rejecting this, the Commission "found that respondents' avowed reason for their practices is not worthy of belief" and that their actual intent "was to protect and foster their own interests as shrimp canners by inhibiting the shrimp canners packing the pandalid shrimp of the Northwest. (The family of the peeling machine firms engages in shrimp canning through another corporate enterprise.)"

"The respondents' and other Gulf Coast canners' fear of the embryo Northwest shrimp manufactory stems from two factors: the comparative low cost of pandalid shrimp and the static condition of the canned shrimp market. These factors convinced the respondents that unless defensive steps were taken the Gulf Coast shrimp industry would be unable to compete and would be eventually overpowered by the new competition from the Northwest."

Commissioner MacIntyre pointed out that several Northwest "canners who ceased canning shrimp entirely testified that they would have been able to continue operations and garner a reasonable profit had they been charged the same rates as those enjoyed by the Gulf canners. The statistical evidence completely supports this testimony, for in most cases the excess rental charged was substantially greater than the losses experienced."

"As we view it, respondents' conduct is completely undefensible. It constitutes a hasty, almost panicky, reaction to a new competitive threat. Their activities are shortsighted and economically self-defeating. The long-range interests of the shrimp canning industry in this country and of the economy as a whole lie in increased, rather than curtailed, competition. This industry is selling in a market which has remained static for four decades. While in recent years the lack of growth may be blamed to a certain extent upon the increasing popularity with the public of frozen shrimp products, this was not true for the entire period and does not constitute a complete explanation today. A principal reason for the static condition of this universe

is the complete failure of the producers to aggressively exploit their product by an aggressive program of consumer education. The money spent for advertising by the industry as a whole has been insignificant and this record indicates that an untapped market consisting of 76 percent of all American families is awaiting exploitation. If, as this record indicates, the supplies of shrimp in the Alaskan fishery are indeed unlimited, the potential for the Northwest shrimp canning industry directly and for the respondents indirectly through increased utilization of their machines is likewise unlimited.

"In view of all the foregoing facts and conclusions, it is the decision of this Commission that the respondents have engaged in unfair methods of competition and unfair acts or practices in commerce in violation of Section 5 of the Federal Trade Commission Act. The gravamen of the offense so found is the fixing and charging of higher discriminatory peeling machine rental rates to producers of canned shrimp located in the Northwestern United States with the result and effect of injuring and destroying competition between said Northwest canners and canners located in the Gulf and South Atlantic areas of the United States."

The Commission similarly held to be unlawful respondents' practice of refusing to sell their machinery to American canners while selling it to foreign competitors.

"Since the practice of selling shrimp processing machinery to foreigners is of comparatively recent origin, the full effects of the practice have yet to be felt by the domestic shrimp canning industry," Commissioner MacIntyre stated. "However, there is sufficient evidence in the record to support a finding that the probable effects of the practice will be to injure and seriously curtail the competitive abilities of domestic canners in two relevant markets: one consisting of the entire United States and the other the total of all foreign countries."

He pointed out that the "inevitable result of this practice is to maintain high production costs at home and to permit to foreigners lower production costs. The resulting imbalance of competitive ability can have no other effect than to make it increasingly difficult for our domestic producers to compete for foreign markets. On the other hand, we could reasonably expect that with lower peeling costs our domestic canners could expand their foreign sales. To impede or prevent such expansion is no less of an unfair practice or unreasonable restraint than to occasion a diminution in market position."

The Commission also noted that American sellers of shrimp "testified that competition from Japanese imports was becoming an increasingly serious factor in the domestic shrimp market. Apparently most canners in both the Northwestern United States and along the Gulf Coast are apprehensive with respect to this already serious competition and the almost inevitable probability that the present relative trickle of imported canned shrimp will increase to a flood. . . .

"The discomfiture of the American canners is understandable, for the respondents have placed them in an untenable position. They are required to operate with static higher peeling costs--costs which remain at a constant level without regard for production level. Foreign canners using machines purchased from respondents experience initial lower costs which recede

with increased production. American canners have been placed at a competitive disadvantage by respondents' foreign sales and the likelihood is that their foreign competitors, particularly the Japanese, will enlarge their penetration of the United States canned shrimp market. Domestic canners are powerless in the face of respondents' patent monopoly to effect any change in their competitive position vis-a-vis their foreign competitors using respondents' machines and the public interest requires remedial action on their behalf. Respondents' discriminatory practice of selling to some, but not all, competing canners has been shown by this record to be unfair and violative of Section 5 of the Federal Trade Commission Act."

On the other hand, the FTC dismissed the complaint as to the family's shrimp canning enterprise and the president of that firm.

Also dismissed were allegations in the complaint that respondents have utilized various unlawful means to gain, perpetuate, or extend a monopoly position in the shrimp processing machinery field, and that the family's shrimp canning firm and the individual respondents combined to adopt and carry out the alleged monopolistic practices.

Commissioner Philip Elman filed a separate opinion stating his views. He said, among other things, that due to respondents' discriminatory prices the "Northwest canners have been forced to the wall and may well be eliminated as a competitive factor in the shrimp canning industry."

"The short of it is that respondents' insistence on charging a monopoly price may well result in the destruction of a substantial segment of the shrimp canning industry. This result, which is not dictated by efficiency--for . . . the cost of processing shrimp by machine is the same regardless of the size of the shrimp--but by monopoly power, is clearly opposed to the objectives of antitrust policy. The right of a monopolist to exploit his monopoly (whether such monopoly is conferred by patents or otherwise) by charging a monopolist's discriminatory price does not, in my opinion, include the right to destroy or cripple a major segment of an industry, but must yield in such a case to the policy of competition embodied in the antitrust laws. . . . In the circumstances, respondents' refusal to treat the Northwest and the Gulf Coast shrimp canners on equal terms is an abuse of monopoly power. It has substantially and unjustifiably injured competition in the shrimp canning industry. It is therefore an unfair method of competition forbidden by Section 5."

However, continued Commissioner Elman, "So far as the charge relating to unlawful discrimination by respondents between foreign and domestic shrimp canners is concerned, I am compelled to dissent from the Commission's finding of violation. The record tells us altogether too little about the costs of foreign shrimp canners to justify an inference of competitive injury. Nor is it at all clear to what extent being able to purchase rather than lease respondents' shrimp processing machinery represents a net cost savings to the foreign canners."



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

AMENDMENT TO STANDARD OF IDENTITY FOR CANNED TUNA EFFECTIVE JUNE 15, 1964:

With reference to amending the standard of identity for canned tuna by listing sodium acid pyrophosphate as an optional ingredient for inhibiting the development of struvite crystals, notice was given on May 27, 1964, by the U. S. Food and Drug Administration, that no objections were filed to the order published in the Federal Register of April 16, 1964. Accordingly, the amendment promulgated by that order became effective on June 15, 1964. The Notice was published in the Federal Register of June 3, 1964.

An earlier Notice that a petition had been filed with the U. S. Food and Drug Administration proposing that the standard of identity for canned tuna be amended was published in the February 6, 1964, Federal Register. It invited all interested persons to submit their views regarding the proposal.

Note: See Commercial Fisheries Review, June 1964 p. 62.



Department of the Interior

FISH AND WILDLIFE SERVICE

PROPOSED REVISED STANDARDS FOR GRADES OF FROZEN FISH BLOCKS:

Notice of proposed revised standards for grades of frozen fish blocks was published in the Federal Register, June 12, 1964, by the Department of the Interior in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended (7 U. S. C. 1621-1627). The proposed revised standards would be issued as an amendment to Part 263 of Title 50, Code of Federal Regulations, and would supersede the standards that have been in effect since July 1958.

The notice of proposed revised standards for grades of frozen fish blocks as it appeared in the Federal Register, June 12, 1964, follows:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR PART 263]

FROZEN FISH BLOCKS

Proposed U.S. Standards for Grades

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e), it is proposed to amend five sections of Part 263 of Title 50, Code of Federal Regulations. The purpose of this amendment is to issue standards for grades of frozen fish blocks in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended (7 U.S.C. 1621-1627).

It is the policy of the Department of the Interior whenever practicable, to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Director, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington 25, D.C., within 30 days of the date of publication of this notice in the FEDERAL REGISTER.

STEWART L. UDALL,
Secretary of the Interior.

JUNE 5, 1964.

Second issue. These standards will supersede the standards that have been in effect since July 1958.

§ 263.1 Description of the product.

Frozen fish blocks are rectangular-shaped masses of cohering frozen fish flesh of a single species. They consist of adequately drained whole, wholesome fillets or pieces of whole, wholesome fillets cut into small portions but not ground or comminuted; and they are frozen and maintained at temperatures necessary for the preservation of the product. Frozen fish blocks are made in two styles.

(a) *Style I—skinless fish blocks.* Fish blocks that have been made from skinless fillets.

(b) *Style II—skin-on fish blocks.* Fish blocks that have been made from demonstrably acceptable skin-on fillets.

§ 263.2 Grades of frozen fish blocks.

(a) "U.S. Grade A" is the quality of frozen fish blocks that (1) possess a good flavor and odor and that (2) have a total score of 85 to 100 points for those factors that are rated in accordance with the scoring system outlined in this part.

(b) "U.S. Grade B" is the quality of frozen fish blocks that (1) possess at least a reasonably good flavor and odor and that (2) have a total score of 70 to 84 points for those factors that are rated in accordance with the scoring system in this part.

(c) "Substandard" is the quality of frozen fish blocks that meet product description but fail to meet the requirements of U.S. Grade B.

§ 263.11 Determination of the grade.

The grade is determined by examining the product in the frozen, thawed, and

TABLE 1—SCHEDULE OF POINT DEDUCTIONS PER SAMPLE UNIT

State	No.	Factors scored	Aspects determining score	Deduct
Frozen	1	Color.....	Small degree: Moderate yellowing..... Large degree: Excessive yellowing and/or rusting.....	4 10
	2	Dehydration.....	Minor: Moderate dehydration for each 10 percent of surface area affected. Major: Excessive dehydration for each 10 percent of surface area affected.	3 6
	3	Uniformity of size.....	Minor: Each deviation from declared size in length, width, or thickness $\pm 1/4$ to $3/4$ inch. Major: Each deviation from declared size in length, width, or thickness over $\pm 3/4$ inch.	3 6
	4	Uniformity of weight.....	Minor: Any minus deviation from declared weight of more than 1 ounce but not more than 4 ounces. Major: Any minus deviation from declared weight more than 4 ounces.	3 8
	5	Angles.....	Edge angle—2 out of 3 readings deviating $3/4$ inch. Corner angle—each angle deviating $3/4$ inch.	3
	6	Improper fill.....	For each 1 ounce unit cut from the block that would be adversely affected due to air spaces, ice spaces, depressions, ragged edges, damage, or imbedded packaging material.	1
Thawed	7	Blemishes.....	Each blemish in 5 pounds of fish block.....	2
	8	Bones.....	Each instance of bones in 5 pounds of fish block.....	5
Cooked	9	Texture.....	Small Degree: Moderately tough, dry, rubbery, or mushy...	8
			Large Degree: Excessively tough, dry, rubbery, or mushy...	15

cooked states and is evaluated by considering the following factors:

(a) *Factors rated by score points.* Points are deducted for variation in the quality of each factor in accordance with the schedule in table 1. The total of points deducted is subtracted from 100 to obtain the score. The maximum score is 100; the minimum score is 0.

(b) *Factors not rated by score points.* The factor of "flavor and odor" is evaluated organoleptically by smelling and tasting the product after it has been cooked in accordance with § 263.25.

(1) Good flavor and odor (essential requirements for a Grade A product) means that the cooked product has the typical flavor and odor of the indicated species of fish and is free from rancidity, bitterness, staleness, and off-flavors and off-odors of any kind.

(2) Reasonably good flavor and odor (minimum requirements of a Grade B product) means that the cooked product is lacking in good flavor and odor but is free from objectionable off-flavors and off-odors of any kind.

§ 263.21 Definitions.

(a) *Examination of sample, frozen state.* (1) Color refers to reasonably uniform color characteristic of the species used. Deviations from normal color include noticeable yellowing and/or rusting of the fish surface.

(2) Dehydration refers to loss of moisture from the fish surfaces during frozen storage. Moderate dehydration is color-masking and can easily be scraped off with a fingernail. Excessive dehydration is deep color-masking and requires a knife or other hard instrument to scrape it off.

(3) Uniformity of size refers to the degree of conformity to the declared size. A deviation is considered to be any deviation from stated length, width or thickness, or from the average dimensions if no dimensions are stated. Only one de-

viation from each dimension may be assessed. Two readings for length, three readings for width, and four readings for thickness will be measured.

(4) Uniformity of weight refers to the degree of conformity to the weight. Only underweight deviations are assessed.

(5) An acceptable edge angle is an angle formed by two adjoining surfaces whose apex is within $3/4$ inch of a carpenter's square placed along the surfaces. For each edge angle, three readings will be made and at least two readings must be acceptable for the whole edge angle to be acceptable. An acceptable corner angle is an angle formed by 3 adjoining surfaces whose apex is within $3/4$ inch of the apex of a carpenter's square placed on the edge surfaces. Unacceptable angles fail to meet these criteria.

(6) Improper fill refers to surface and internal air or ice voids, ragged edges, or damage. It is measured as the number of 1-ounce units that would be adversely affected when the block is cut. For this purpose, the 1-ounce unit is considered to be $4 \times 1 \times 1/2$ inch.

(b) *Examination of the product, thawed state.* (1) Blemishes refer to a piece of skin, scale, a blood spot, a fin, a bruise, a black belly lining, a piece of nape membrane or a harmless piece of extraneous material. One "piece of skin" consists of one piece $1/2$ square inch in area; except that for skin patches larger than 1 square inch, an additional instance shall be assessed for each additional $1/2$ square inch in area. "Blood spot" is one of such size and degree as to be considered objectionable. A "piece of black belly lining" is any piece longer than $1/2$ inch. "Fin" is one fin or one identifiable part of a fin. A piece of nape membrane consists of one piece $1/2$ square inch in area or larger. "Scales" are aggregates of one or more scales of such degree as to be considered objectionable. Skin is not to be considered a blemish

on Style II block. Blemishes are measured on a 5-pound portion cut from the edge of the fish block and thawed.

(2) "Bones" refers to any potentially harmful bones in the fish block. A potentially harmful bone is one that after being cooked is capable of piercing or hurting the palate. One instance of bones means one bone or group of bones occupying or contacting a circular area of 1 square inch. Bones are measured on the same 5-pound thawed portion cut from the fish block.

(c) *Examination of the cooked product.* (1) Heating in a suitable manner means heating the product in one of two ways, as follows:

(i) Cut three or more portions about 4 by 3 by $1/2$ inches from a frozen block. Wrap them individually or in a single layer in aluminum foil. Place the package portions on a wire rack suspended over boiling water in a covered container. Steam the packaged portions until the product is thoroughly heated, or

(ii) Cut and package the portions as previously described. Place the packaged portions on a flat cookie sheet or shallow flat-bottom pan of sufficient size so that the packages can be evenly spread on the sheet or pan. Place the pan and frozen contents in a properly ventilated oven heated to 400° F. and remove when the product is thoroughly heated.

(2) Texture refers to the condition of the cooked fish flesh. The texture should be firm, slightly resilient, but not tough or rubbery; and should be moist, but not mushy. Deductions for texture will follow the deductions assessed in table 1.

(3) Flavor and odor is evaluated organoleptically as described in § 263.11(b).

(4) *General definitions.* (1) "Demonstrably acceptable" shall mean that the product has been produced commercially and met customer acceptance.

(2) "Adversely affected" shall mean that the unit cut would deviate more than 15 percent plus or minus from 1 ounce.

(3) "Small" (overall assessment) refers to a condition that is noticeable, but is not seriously objectionable.

(4) "Large" (overall assessment) refers to a condition that is not only noticeable, but is seriously objectionable.

(5) "Minor" (measured quantity or area) refers to a defect that affects the appearance or utility of the product or both.

(6) "Major" (measured quantity or area) refers to a defect that seriously affects the appearance or utility of the product or both.

§ 263.25 Tolerances for certification of officially drawn samples.

The sample rates and grades of specific lots shall be certified on the basis of the regulations governing inspection and certification of processed fishery products, processed products thereof, and certain other processed food products.

* * * * *

WHALING REGULATIONS AMENDED:

The regulations of the International Whaling Commission as amended October 9, 1963, were published in the Federal Register, June 16, 1964, to amend and succeed Part 351--Whaling, Code of Federal Regulations, Title 50--Wildlife and Fisheries. The revised regulations became effective on publication in the Federal Register. The only changes relating to current United States commercial whaling operations are the provisions providing for certain exceptions in the minimum length of blue, sei, and fin whales which can be landed at land stations in the Northeast Pacific area.

The new regulations as they appeared in the Federal Register, June 16, 1964, follow:

Title 50--WILDLIFE AND FISHERIES

Chapter III--International Regulatory Agencies (Fishing and Whaling)

SUBCHAPTER B--INTERNATIONAL WHALING COMMISSION

PART 351--WHALING

Section 13 of the Whaling Convention Act of 1949 (64 Stat. 425; 16 U.S.C. 916k), the legislation implementing the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946, by the United States of America and certain other Governments, provides that regulations of the International Whaling Commission shall be submitted for publication in the Federal Register by the Secretary of the Interior. Regulations of the Commission are defined to mean the whaling regulations in the schedule annexed to and constituting a part of the Convention in their original form or as modified, revised, or amended by the Commission. The provisions of the whaling regulations, as originally embodied in the schedule annexed to the Convention, have been amended several times by the International Whaling Commission, the last amendments having been brought into effect on October 9, 1963. The provisions of these regulations are applicable to nationals and whaling enterprises of the United States. The only change relating to current United States commercial whaling operations is that found in § 351.9 (a) and (b), providing for certain exceptions in the minimum length of blue, sei, and fin whales which can be landed at land stations in the Northeast Pacific area. These changes allow the taking of blue whales not less than 65 feet, sei whales not less than 35 feet, and fin whales not less than 50 feet for delivery to land stations in the Northeast Pacific area without regard to their use as human or animal food for local consumption for a period of three years starting April 1, 1962.

Amendments to the whaling regulations are adopted by the International

Whaling Commission pursuant to Article V of the Convention without regard to the notice and public procedure requirements of the Administrative Procedure Act (5 U.S.C. 1001). Accordingly, in fulfillment of the duty imposed upon the Secretary of the Interior by section 13 of the Whaling Convention Act of 1949, the whaling regulations published as Part 351, Title 50, Code of Federal Regulations, as the same appeared in 25 F.R. 8465, September 1, 1960, are amended and republished to read as hereinafter set forth.

Regulations of the Department of the Interior, implementing the Whaling Convention Act of 1949, are set forth in 50 CFR Part 230--Whaling.

These regulations shall become effective upon the date of publication in the FEDERAL REGISTER.

- | | |
|--------|--|
| Sec. | |
| 351.1 | Inspection. |
| 351.2 | Killing of gray or right whales prohibited. |
| 351.3 | Killing of calves or suckling whales prohibited. |
| 351.4 | Operation of factory ships limited. |
| 351.5 | Closed area for factory ships in Antarctic. |
| 351.6 | Limitations on the taking of humpback whales. |
| 351.7 | Closed seasons for pelagic whaling for baleen and sperm whales. |
| 351.8 | Catch quota for baleen whales. |
| 351.9 | Minimum size limits. |
| 351.10 | Closed seasons for land stations. |
| 351.11 | Use of factory ships in waters other than south of 40° South Latitude. |
| 351.12 | Limitations on processing of whales. |
| 351.13 | Prompt processing required. |
| 351.14 | Remuneration of employees. |
| 351.15 | Submission of laws and regulations. |
| 351.16 | Submission of statistical data. |
| 351.17 | Factory ship operations within territorial waters. |
| 351.18 | Definitions. |

AUTHORITY: The provisions of this Part 351 issued under Article V, 62 Stat. 1718. Interpret or apply secs. 2-14, 64 Stat. 421-425; 16 U.S.C. 916 et seq.

§ 351.1 Inspection.

(a) There shall be maintained on each factory ship at least two inspectors of whaling for the purpose of maintaining twenty-four hour inspection and also such observers as the member countries engaged in the Antarctic pelagic whaling may arrange to place on each other's factory ships. These inspectors shall be appointed and paid by the Government having jurisdiction over the factory ship: *Provided*, That inspectors need not be appointed to ships which, apart from the storage of products, are used during the season solely for freezing or salting the meat and entrails of whales intended for human food or for the feeding of animals.

(b) Adequate inspection shall be maintained at each land station. The inspectors serving at each land station shall be appointed and paid by the Government having jurisdiction over the land station.

§ 351.2 Killing of gray or right whales prohibited.

It is forbidden to take or kill gray whales or right whales, except when the meat and products of such whales are to be used exclusively for local consumption by the aborigines.

§ 351.3 Killing of calves or suckling whales prohibited.

It is forbidden to take or kill calves or suckling whales or female whales which are accompanied by calves or suckling whales.

§ 351.4 Operation of factory ships limited.

(a) It is forbidden to kill blue whales in the North Atlantic Ocean for five years ending on February 24, 1965.

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales in any of the following areas:

(1) In the waters north of 66° North Latitude except that from 150° East Longitude eastwards as far as 140° West Longitude the taking or killing of baleen whales by a factory ship or whale catcher shall be permitted between 66° North Latitude and 72° North Latitude;

(2) In the Atlantic Ocean and its dependent waters north of 40° South Latitude;

(3) In the Pacific Ocean and its dependent waters east of 150° West Longitude between 40° South Latitude and 35° North Latitude;

(4) In the Pacific Ocean and its dependent waters west of 150° West Longitude between 40° South Latitude and 20° North Latitude;

(5) In the Indian Ocean and its dependent waters north of 40° South Latitude.

§ 351.5 Closed area for factory ships in Antarctic.

It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales in the waters south of 40° South Latitude from 70° West Longitude westward as far as 160° West Longitude. (This paragraph as a result of a decision of the fourteenth meeting was rendered inoperative until the Commission otherwise decides.)

§ 351.6 Limitations on the taking of humpback whales.

(a) It is forbidden to kill or attempt to kill humpback whales in the North Atlantic Ocean for a period ending on November 8, 1964. Notwithstanding this closed season, the taking of 10 humpback whales per year is permitted in Greenland waters provided that whale catchers of less than 50 gross register tonnage are used for this purpose.

(b) It is forbidden to kill or attempt to kill humpback whales in the waters south of the equator.

(c) It is forbidden to kill or attempt to kill blue whales in the waters south of 40° South Latitude, except in the waters north of 55° South Latitude from 0° eastwards to 80° East Longitude.

§ 351.7 Closed seasons for pelagic whaling for baleen and sperm whales.

(a) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill baleen whales (excluding minke whales) in any waters south of 40° South Latitude, except during the period from December 12 to April 7, following, both days inclusive; and no such whale catcher shall be used for the purpose of

killing or attempting to kill blue whales before February 14 in any year.¹

(b) It is forbidden to use a whale catcher attached to a factory ship for the purpose of killing or attempting to kill sperm or minke whales, except as permitted by the Contracting Governments in accordance with paragraphs (c), (d), and (e) of this section.

(c) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction, one continuous open season not to exceed eight months out of any period of twelve months during which the taking or killing of sperm whales by whale catchers may be permitted: *Provided*, That a separate open season may be declared for each factory ship and the whale catchers attached thereto.

(d) Each Contracting Government shall declare for all factory ships and whale catchers attached thereto under its jurisdiction one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by the whale catchers may be permitted: *Provided*, That:

(1) A separate open season may be declared for each factory ship and the whale catchers attached thereto;

(2) The open season need not necessarily include the whole or any part of the period declared for other baleen whales pursuant to paragraph (a) of this section.

(e) Each Contracting Government shall declare for all whale catchers under its jurisdiction not operating in conjunction with a factory ship or land station one continuous open season not to exceed six months out of any period of twelve months during which the taking or killing of minke whales by such whale catchers may be permitted. Notwithstanding this paragraph, one continuous open season not to exceed eight months may be implemented so far as Greenland is concerned.

§ 351.8 Catch quota for baleen whales.

(a) The number of baleen whales taken during the open season caught in waters south of 40° South Latitude by whale catchers attached to factory ships under the jurisdiction of the Contracting Governments shall not exceed ten thousand blue whale units in 1963/64.

(b) For the purposes of paragraph (a) of this section, blue whale units shall be calculated on the basis that one blue whale equals:

- (1) Two fin whales or
- (2) Two and a half humpback whales or
- (3) Six sei whales.

(c) Notification shall be given in accordance with the provisions of Article VII of the Convention, within two days after the end of each calendar week, of data on the number of blue whale units

¹ The amendment of § 351.7(a) of the starting date of the blue whale season from February 1 to February 14 was objected to within the prescribed period by the Governments of Japan, the Netherlands, Norway, the United Kingdom and the Union of Soviet Socialist Republics. The objections were not withdrawn and the amendment came into force on January 26, 1961 but is not binding upon Japan, the Netherlands, Norway, the United Kingdom and the Union of Soviet Socialist Republics.

taken in any waters south of 40° South Latitude by all whale catchers attached to factory ships under the jurisdiction of each Contracting Government: *Provided*, That when the number of blue whale units is deemed by the Bureau of International Whaling Statistics to have reached 9,000, notification shall be given as aforesaid at the end of each day of data on the number of blue whale units taken.

(d) If it appears that the maximum catch of whales permitted by paragraph (a) of this section may be reached before April 7 of any year, the Bureau of International Whaling Statistics shall determine, on the basis of the data provided, the date on which the maximum catch of whales shall be deemed to have been reached and shall notify the master of each factory ship and each Contracting Government of that date not less than four days in advance thereof. The killing or attempting to kill baleen whales by whale catchers attached to factory ships shall be illegal in any waters south of 40° South Latitude after midnight of the date so determined.

(e) Notification shall be given in accordance with the provisions of Article VII of the Convention of each factory ship intending to engage in whaling operations in any waters south of 40° South Latitude.²

§ 351.9 Minimum size limits.

(a) It is forbidden to take or kill any blue, sei or humpback whales below the following lengths:

Blue whales 70 feet (21.3 metres),

Sei whales 40 feet (12.2 metres),

Humpback whales 35 feet (10.7 metres),

except that blue whales of not less than 65 feet (19.8 metres) and sei whales of not less than 35 feet (10.7 metres) in length may be taken for delivery to land stations, provided that, except in the Northeast Pacific area for a period of three years starting 1 April 1962, the meat of such whales is to be used for local consumption as human or animal food.

(b) It is forbidden to take or kill any fin whales below 57 feet (17.4 metres) in length for delivery to factory ships or land stations in the Southern Hemisphere, and it is forbidden to take or kill fin whales below 55 feet (16.8 metres) for delivery to factory ships or land stations in the Northern Hemisphere; except that fin whales of not less than 55 feet (16.8 metres) may be taken for delivery to land stations in the Southern Hemisphere and fin whales of not less than 50 feet (15.2 metres) may be taken for delivery to land stations in the Northern Hemisphere provided that, except in the Northeast Pacific area for a period of three years starting 1 April 1962, in each case, the meat of such whales is to be used for local consumption as human or animal food.

(c) It is forbidden to take or kill any sperm whales below 38 feet (11.6 metres) in length, except that sperm whales of not less than 35 feet (10.7 metres) in length may be taken for delivery to land stations.

² Section 351.9(e) in earlier copies was deleted by the Commission at its fourth meeting in 1932 and the deletion became effective on September 12, 1952. Original paragraph (f) consequently becomes paragraph (e).

(d) Whales must be measured when at rest on deck or platform, as accurately as possible by means of a steel tape measure fitted at the zero end with a spiked handle which can be stuck into the deck planking abreast of one end of the whale. The tape measure shall be stretched in a straight line parallel with the whale's body and read abreast the other end of the whale. The ends of the whale, for measurement purposes, shall be the point of the upper jaw and the notch between the tail flukes. Measurements, after being accurately read on the tape measure, shall be logged to the nearest foot, that is to say, any whale between 75 feet 6 inches and 76 feet 6 inches shall be logged as 76 feet, and any whale between 76 feet 6 inches and 77 feet 6 inches shall be logged as 77 feet. The measurement of any whale which falls on an exact half foot shall be logged at the next half foot, e.g., 76 feet 6 inches precisely shall be logged as 77 feet.

§ 351.10 Closed seasons for land stations.

(a) It is forbidden to use a whale catcher attached to a land station for the purpose of killing or attempting to kill baleen and sperm whales except as permitted by the Contracting Government in accordance with paragraphs (b), (c), and (d) of this section.

(b) Each Contracting Government shall declare for all land stations under its jurisdiction, and whale catchers attached to such land stations, one open season during which the taking or killing of baleen (excluding minke) whales by the whale catchers shall be permitted. Such open season shall be for a period of not more than six consecutive months in any period of twelve months and shall apply to all land stations under the jurisdiction of the Contracting Government: *Provided*, That a separate open season may be declared for any land station used for the taking or treating of baleen (excluding minke) whales which is more than 1,000 miles from the nearest land station used for the taking or treating of baleen (excluding minke) whales under the jurisdiction of the same Contracting Government.

(c) Each Contracting Government shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations, one open season not to exceed eight continuous months in any one period of twelve months, during which the taking or killing of sperm whales by the whale catchers shall be permitted, such period of eight months to include the whole of the period of six months declared for baleen whales (excluding minke whales) as provided for in paragraph (b) of this section: *Provided*, That a separate open season may be declared for any land station used for the taking or treating of sperm whales which is more than 1,000 miles from the nearest land station used for the taking or treating of sperm whales under the jurisdiction of the same Contracting Government.²

² Section 351.10(c) came into force as from February 21, 1952, in respect to all Contracting Governments, except the Commonwealth of Australia, which lodged an objection to it within the prescribed period, and this objection was not withdrawn. The provisions of this paragraph are not, therefore, binding on the Commonwealth of Australia.

(d) (1) Each Contracting Government shall declare for all land stations under its jurisdiction and for whale catchers attached to such land stations one open season not to exceed six continuous months in any period of twelve months during which the taking or killing of minke whales by the whale catchers shall be permitted (such period not being necessarily concurrent with the period declared for other baleen whales, as provided for in paragraph (b) of this section): *Provided*, That a separate open season may be declared for any land station used for the taking or treating of minke whales which is more than 1,000 miles from the nearest land station used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government.

(2) Except that a separate open season may be declared for any land station used for the taking or treating of minke whales which is located in an area having oceanographic conditions clearly distinguishable from those of the area in which are located the other land stations used for the taking or treating of minke whales under the jurisdiction of the same Contracting Government; but the declaration of a separate open season by virtue of the provisions of this paragraph shall not cause thereby the period of time covering the open seasons declared by the same Contracting Government to exceed nine continuous months of any twelve months.

(e) The prohibitions contained in this section shall apply to all land stations as defined in Article II of the Whaling Convention of 1946 and to all factory ships which are subject to the regulations governing the operation of land stations under the provisions of § 351.17.

§ 351.11 Use of factory ships in waters other than south of 40° South Latitude.

It is forbidden to use a factory ship which has been used during a season in any waters south of 40° South Latitude for the purpose of treating baleen whales, in any other area for the same purpose within a period of one year from the termination of that season: *Provided*, That this paragraph shall not apply to a ship which has been used during the season solely for freezing or salting the meat and entrails of whales intended for human food or feeding animals.

§ 351.12 Limitations on processing of whales.

(a) It is forbidden to use a factory ship or a land station for the purpose of treating any whales (whether or not killed by whale catchers under the jurisdiction of a Contracting Government) the killing of which by whale catchers under the jurisdiction of a Contracting Government is prohibited by the provisions of §§ 351.2, 351.4, 351.5, 351.6, 351.7, 351.8, or § 351.10.

(b) All other whales (except minke whales) taken shall be delivered to the factory ship or land station and all parts of such whales shall be processed by boiling or otherwise, except the internal organs, whale bone and flippers of all whales, the meat of sperm whales and of parts of whales intended for human food or feeding animals. A Contracting Government may in less developed regions exceptionally permit treating of whales

without use of land stations provided that such whales are fully utilized in accordance with this paragraph.

(c) Complete treatment of the carcasses of "Dauhval" and of whales used as fenders will not be required in cases where the meat or bone of such whales is in bad condition.

§ 351.13 Prompt processing required.

(a) The taking of whales for delivery to a factory ship shall be so regulated or restricted by the master or person in charge of the factory ship that no whale carcass (except of a whale used as a fender, which shall be processed as soon as is reasonably practicable) shall remain in the sea for a longer period than thirty-three hours from the time of killing to the time when it is hauled up for treatment.

(b) Whales taken by all whale catchers, whether for factory ships or land stations, shall be clearly marked so as to identify the catcher and to indicate the order of catching.

(c) All whale catchers operating in conjunction with a factory ship shall report by radio to the factory ship:

- (1) The time when each whale is taken,
- (2) Its species, and
- (3) Its marking effected pursuant to paragraph (b) of this section.

(d) The information reported by radio pursuant to paragraph (c) of this section shall be entered immediately in a permanent record which shall be available at all times for examination by the whaling inspectors; and in addition there shall be entered such permanent record the following information as soon as it becomes available:

- (1) Time of hauling up for treatment,
- (2) Length, measured pursuant to paragraph (d) of § 351.9,
- (3) Sex,
- (4) If female, whether milk-filled or lactating,
- (5) Length and sex of foetus, if present, and
- (6) A full explanation of each infraction.

(e) A record similar to that described in paragraph (d) of this section shall be maintained by land stations, and all of the information mentioned in the said paragraph shall be entered therein as soon as available.

§ 351.14 Remuneration of employees.

Gunnery and crews of factory ships, land stations, and whale catchers shall be engaged on such terms that their remuneration shall depend to a considerable extent upon such factors as the species, size and yield of whales taken and not merely upon the number of the whales taken. No bonus or other remuneration shall be paid to the gunners or crews of whale catchers in respect to the taking of milk-filled or lactating whales.

§ 351.15 Submission of laws and regulations.

Copies of all official laws and regulations relating to whales and whaling and changes in such laws and regulations shall be transmitted to the Commission.

§ 351.16 Submission of statistical data.

Notification shall be given in accordance with the provisions of Article VII

of the Convention with regard to all factory ships and land stations of statistical information (a) concerning the number of whales of each species taken, the number thereof lost, and the number treated at each factory ship or land station, and (b) as to the aggregate amounts of oil of each grade and quantities of meal, fertilizer (guano), and other products derived from them, together with (c) particulars with respect to each whale treated in the factory ship or land station as to the date and approximate latitude and longitude of taking, the species and sex of the whale, its length and, if it contains a foetus, the length and sex, if ascertainable, of the foetus. The data referred to in paragraphs (a) and (c) of this section shall be verified at the time of the tally and there shall also be notification to the Commission of any information which may be collected or obtained concerning the calving grounds and migration routes of whales. In communicating this information, there shall be specified:

- (1) The name and gross tonnage of each factory ship;
- (2) The number of whale catchers, including separate totals for surface vessels and aircraft and specifying, in the case of surface vessels, the average length and horsepower of whale catchers;
- (3) A list of the land stations which were in operation during the period concerned.

§ 351.17 Factory-ship operations within territorial waters.

(a) A factory ship which operates solely within territorial waters in one of the areas specified in paragraph (c) of this section, by permission of the Government having jurisdiction over those waters, and which flies the flag of that Government shall, while so operating, be subject to the regulations governing the operation of land stations and not to the regulations governing the operation of factory ships.

(b) Such factory ship shall not, within a period of one year from the termination

'Section 351.17 (a), (b), and (c) (1) to (3), was inserted by the Commission at its first meeting in 1949, and came into force on January 11, 1950, as regards all Contracting Governments except France, which

of the season in which she so operated, be used for the purpose of treating baleen whales in any of the other areas specified in paragraph (c) of this section or south of 40° South Latitude.

(c) The areas referred to in paragraphs (a) and (b) of this section are:

(1) On the coast of Madagascar and its dependencies;

(2) On the west coasts of French Africa;

(3) On the coasts of Australia, namely on the whole east coast and on the west coast in the area known as Shark Bay and northward to Northwest Cape and including Exmouth Gulf and King George's Sound, including the port of Albany;

(4) On the Pacific coast of the United States of America between 35° North Latitude and 49° North Latitude.

§ 351.18 Definitions.

(a) The following expressions have the meanings respectively assigned to them, that is to say:

"Baleen whale" means any whale which has baleen or whale bone in the mouth, i.e., any whale other than a toothed whale.

"Blue whale" (*Balaenoptera* or *Sibbaldus musculus*) means any whale known by the name of blue whale, *Sibbald's* rorqual, or sulphur bottom.

"Dauhvai" means any unclaimed dead whale found floating.

"Fin whale" (*Balaenoptera physalus*) means any whale known by the name of common finback, common rorqual, finback, finner, fin whale, herring whale, razorback, or true fin whale.

"Gray whale" (*Rhachianectes glaucus*) means any whale known by the name of gray whale, California gray, devil fish, hard head, mussel digger, gray back or rip sack.

therefore remain bound by the provisions of the original § 351.17, which reads as follows:

"§ 351.17 Notwithstanding the definition of land station contained in Article II of the Convention, a factory ship operating under the jurisdiction of a Contracting Government, and the movements of which are confined solely to the territorial waters of that Government, shall be subject to the regulations governing the operation of land sta-

"Humpback whale" (*Megaptera nodosa* or *novaeangliae*) means any whale known by the name of bunch, humpback, humpback whale, humpbacked whale, hump whale or hunchbacked whale.

"Minke whale" (*Balaenoptera acutorostrata*, *B. Davidsoni*, *B. huttoni*) means any whale known by the name of lesser rorqual, little piked whale, minke whale, pike-headed whale or sharp-headed finner.

"Right whale" (*Balaena mysticetus*; *Eubalaena glacialis*, *E. australis*, etc.; *Neobalaena marginata*) means any whale known by the name of Atlantic right whale, Arctic right whale, Biscayan right whale, bowhead, great polar whale, Greenland right whale, Greenland whale, Nordkaper, North Atlantic right whale, North Cape whale, Pacific right whale, pigmy right whale, Southern pigmy right whale, or Southern right whale.

"Sei whale" (*Balaenoptera borealis*) means any whale known by the name of sei whale, Rudolph's rorqual, pollack whale, or coalfish whale and shall be taken to include Bryde's whale (*B. brydel*).

"Sperm whale" (*Physeter catodon*) means any whale known by the name of sperm whale, spermacet whale, cachalot or pot whale.

"Toothed whale" means any whale which has teeth in the jaws.

(b) "Whales taken" means whales that have been killed and either flagged or made fast to catchers.

STEWART L. UDALL,
Secretary of the Interior.

JUNE 9, 1964.

tions within the following areas: (a) On the coast of Madagascar and its dependencies, and on the west coasts of French Africa; (b) on the west coast of Australia in the area known as Shark Bay and northward to Northwest Cape and including Exmouth Gulf and King George's Sound, including the Port of Albany; and on the east coast of Australia, in Twofold Bay and Jervis Bay."

Section 351.17 (c) (4) was inserted by the Commission at its eleventh meeting in 1959 and came into force on October 5, 1959 as regards all Contracting Governments.

* * * * *

BUREAU OF COMMERCIAL FISHERIES

ALASKA DISASTER RELIEF--CHARTER VESSEL LOAN REGULATIONS:

Loans to commercial fishermen for the purpose of chartering fishing vessels pending the construction or repair of vessels lost, destroyed, or damaged by the Alaska earthquake of March 27, 1964, and subsequent tidal waves related thereto are authorized to be made by the Secretary of the Interior by Section 9 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309), approved May 20, 1964.

New regulations (became effective on publication) implementing such authorization were

published in the Federal Register, May 23, 1964, as follows:

Title 50--WILDLIFE AND FISHERIES

Chapter II--Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F--AID TO FISHERIES

PART 251--CHARTER LOAN PROCEDURES

Section 9 of the Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309), approved on May 20, 1964, authorized the Secretary of the Interior, under such terms and conditions and pursuant to regulations pre-

scribed by him, to make loans to commercial fishermen for the purpose of chartering fishing vessels pending the construction or repair of vessels lost, destroyed or damaged by the earthquake of March 27, 1964, and subsequent tidal waves related thereto. These loans must be made promptly if they are to be of use during the coming fishing season. As these regulations do not provide penalties to the general public and will assist persons qualifying to obtain financial assistance, they will be adopted without the customary notice of proposed rule making. To implement the authorization granted in section 9 of the above-mentioned Act, the following regulations, constituting a new Part under Subchapter F, are adopted and become effective at the beginning of the calendar day on which they are published in the *FEDERAL REGISTER*.

- Sec.
251.1 Definition of terms.
251.2 Purpose.
251.3 Interpretation of loan authorization.
251.4 Qualified loan applicants.
251.5 Basic limitations.
251.6 Use of loan funds.
251.7 Repayment.
251.8 Applications.
251.9 Processing of applications.
251.10 Approval of loans.
251.11 Interest.
251.12 Maturity.
251.13 Security.
251.14 Books, records and reports.
251.15 Insurance required.
251.16 Disclaimer.
251.17 Penalties on default.

AUTHORITY: The provisions of this Part 251 issued under sec. 4, 70 Stat. 1121; 16 U.S.C. 742c and Public Law 88-309.

§ 251.1 Definition of terms.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

- (a) *Secretary*. The Secretary of the Interior or his authorized representative.
(b) *Commercial fishermen*. An individual, partnership or corporation that owned and operated a vessel engaged in catching fish or shellfish during 1963, which vessel was lost, destroyed or damaged in the earthquake of March 27, 1964, and subsequent tidal waves related thereto.
(c) *Charter*. Charter means a bareboat or demise charter, the terms and provisions of which shall be satisfactory to the Secretary.

§ 251.2 Purpose.

The purpose of section 9 of the Commercial Fisheries Research and Development Act of 1964 (the Act) is to offer immediate assistance in the restoration of the fishing fleet which was severely damaged by the earthquake of March 27, 1964, and subsequent tidal waves related thereto. This assistance will consist of short-term loans to enable fishermen, pending the construction or repair of fishing vessels lost, destroyed or damaged as a result of such catastrophe, to bareboat charter vessels for fishing.

§ 251.3 Interpretation of loan authorization.

The terms used in the Act to describe the purposes for which loans may be granted are construed to be limited to the meanings ascribed in this section.

- (a) Chartering fishing vessels: The words "chartering fishing vessels" mean the making of bareboat charters for such

time as may be required, for operations in the fishery in which the applicant was engaged during 1963, until the damaged vessel can be repaired or the lost or destroyed vessel replaced.

(b) Net profits of the operations of such chartered vessels: The words "net profits of the operations of such chartered vessels" mean the net profits computed in accordance with generally accepted accounting practices with due regard to the customs and usage in the locality in which the fishing operation is conducted.

(c) Such reasonable amount as determined by the Secretary for the salary of the fishermen chartering such vessels. The words "such reasonable amount as determined by the Secretary for the salary of the fishermen chartering such vessels" mean the average income of the borrower from operations of the damaged, destroyed or lost vessel during the calendar years 1961, 1962, and 1963, with a maximum of \$4,000 per annum, computed from borrower's income tax returns for said years.

(d) All terms used in Section 4 of the Fish and Wildlife Act of 1956, as amended, applicable hereto shall be as defined in Part 250 of this subchapter. In the event of an inconsistency between the provisions of Part 250 of this subchapter and this Part 251, the latter shall control.

§ 251.4 Qualified loan applicants.

Any citizen of the United States meeting the criteria of this section may be considered a qualified loan applicant.

(a) Any commercial fisherman having a vessel, damaged during the aforementioned earthquake and the subsequent tidal waves related thereto, repaired and such repairs cannot be completed in time to commence fishing operations.

(b) Any commercial fisherman having a vessel, lost or destroyed, whether actually or constructively, during the aforesaid earthquake and tidal waves, replaced and such replacement cannot be obtained in time to commence fishing operations.

(c) Proof of loss, destruction or damage to the vessel and evidence of pending replacement or repair thereof must be furnished to the Secretary at the time the application for the loan is filed.

§ 251.5 Basic limitations.

The basic limitations shall be the same as in § 250.5 of this subchapter.

§ 251.6 Use of loan funds.

The use of the loan funds are restricted to the payment of charter hire when due, until which time the Secretary will hold any balance of funds in escrow. Charter hire is construed to include delivery and redelivery of the vessel.

§ 251.7 Repayment.

Repayment shall be made on or before the maturity date of the note, executed in connection with the loan and, subject to the proviso set forth herein, be required only from the net profits of the operations of the chartered vessel reduced by and in the manner set forth in § 251.3(c). If the aforesaid net profit as so reduced is not equal to the amount of loan repayment due, the amount of such net profit shall be applied in full satisfaction of the note; provided, however, that if the borrower fails to replace

or repair, as the case may be, the lost, destroyed or damaged vessel, to the satisfaction of the Secretary, then the interest rate on the loan shall be 5 percent, computed from the date of the execution of the note, and the entire amount of the note shall be due and payable at maturity without respect to net profit.

§ 251.8 Application.

Any citizen desiring a loan under this part shall make application to the Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, on a loan application form furnished by the Bureau, except that in the discretion of the Secretary, an application made on other than the prescribed form may be considered if the application contains information deemed to be sufficient.

§ 251.9 Processing of applications.

Applications shall be processed as in § 250.7 of this subchapter.

§ 251.10 Approval of loans.

The approval of loans shall be in the same manner as is set forth in § 250.8 of this subchapter.

§ 251.11 Interest.

The rate of interest on all loans which may be charged under the Act (subsection 4(e) of the Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742c)) is fixed at three percent (3%) per annum, except as otherwise provided in § 251.7.

§ 251.12 Maturity.

The period of maturity of any loan which may be granted shall not be longer than 30 days after the termination date of the charter.

§ 251.13 Security.

The loans shall be approved only upon the furnishing of evidence that the past earnings record of the applicant provides reasonable assurance of repayment and the furnishing of any other security required by the Secretary.

§ 251.14 Books, records and reports.

The right of the Secretary to inspect books, records and reports shall be the same as is set forth in § 250.12 of this subchapter.

§ 251.15 Insurance required.

The owner will carry such insurance as may reasonably be necessary to protect the owner and charterer. Premium charges will be included in the charter hire.

§ 251.16 Disclaimer.

No acts performed by the Secretary in the investigation of the loan application or otherwise shall constitute the Secretary as an agent for an owner or charterer and the Secretary does not warrant or represent to any owner or charterer the performance or observance of any obligations of a charterer or owner under any charter or otherwise.

§ 251.17 Penalties on default.

The penalties on default shall be as set forth in § 250.14 of this subchapter.

STEWART L. UDALL,
Secretary of the Interior.

MAY 21, 1964.

Department of Labor

NEW REGULATIONS PROHIBIT WAGE DISCRIMINATION ON ACCOUNT OF SEX:

Regulations contained in Part 800--Equal Pay for Equal Work Under the Fair Standards Act, Title 29--Labor, Code of Federal Regulations were published in the Federal Register, April 25, 1964. The purpose of the new regulations is to make available official interpretations of the Department of Labor with respect to the meaning and application of the equal pay provisions added to the Fair Labor Standards Act by the Equal Pay Act of 1963 (Public Law 88-38). The Equal Pay Act was enacted on June 10, 1963, for the purpose of correcting "the existence in industries engaged in commerce or in the production of goods for commerce of wage differentials based on sex." The law amends the Fair Labor Standards Act by adding a new section 6 (d) to its minimum wage provisions.

The new regulations published in the Federal Register as 29 CFR Part 800 include Subpart A--General, and Subpart B--Requirements of the Equal Pay Act of 1963. Subpart B outlines scope and application in general, the equal pay for equal work standard, exceptions to equal pay standard, enforcement, and effective date.

The effective date of the new provisions is described in the regulations as follows:

"Sec. 800.123 General effective data. The equal pay provisions are effective on June 11, 1964. Full compliance is required on that date except in the case of certain employees covered by collective bargaining agreements for whom the statute further defers the time of its application.

"Sec. 800.124 Effective date for employees covered by collective bargaining agreements. The application of the equal pay provisions is deferred as to employees covered by bona fide collective bargaining agreements, which were in effect on May 11, 1963, and which do not terminate until some date after June 11, 1964. As to employees covered by such agreements the provisions will become effective on the termination date of the agreement or on June 11, 1965, whichever occurs first. . . ."

Small Business Administration

ALASKA FIRMS IN EARTHQUAKE DISASTER AREA RECEIVE SBA LOANS:

In late May 1964, the U. S. Small Business Administration (SBA) approved loans to help two firms which suffered damage during the earthquake in central Alaska, March 27, 1964. A loan of \$150,000 to the Berman Packing Company was approved which will enable the firm to operate its salmon cannery this year at Ninilchik in the Cook Inlet area. The Small Business Administration also approved a participation loan in which that Agency will join with an Alaskan bank to lend the Valdez Cold Storage Company \$250,000 to finish equipping a king crab processing vessel. That firm lost its plant at Valdez, Alaska, during the Good Friday earthquake.

Before the earthquake, the Valdez Cold Storage Company had received an industrial loan of \$184,100 from the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The ARA loan approved March 18, 1964, was made to help expand dock facilities at Valdez and outfit the king crab processing vessel.

Note: See Commercial Fisheries Review, May 1964 p. 78.



Department of the Treasury

INTERNAL REVENUE SERVICE

ALASKANS RECEIVE TIME EXTENSION FOR INCOME TAX REDUCTION CLAIMS:

A decision by the U. S. Internal Revenue Service to grant persons suffering property losses from natural disasters an extension of time in which to apply for Federal income tax rebates was published in the Federal Register, May 19, 1964. The decision was called a "Boon to Alaskans" by the Federal Reconstruction and Development Planning Commission for Alaska.

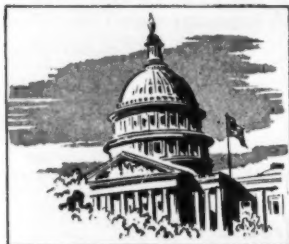
Senator Clinton P. Anderson, Chairman of the Alaska Reconstruction Commission, said that the amendment to Title 26 of the Internal Revenue Code will permit Alaska property owners and businessmen who suffered earthquake damage to amend their 1963 Federal income tax returns in order to seek immediate tax rebates or reductions in their estimated 1964 tax.

Senator Anderson urged all Alaskans owning quake-damaged property to consult the field office of the Internal Revenue Service in Anchorage, Alaska, in order to obtain maximum relief under the law. He pointed out that "all business loss, and all personal property loss over \$100 could be credited against tax payments over the past 3 years. . .thereby producing a considerable cash rebate from the Treasury Department." It was noted that "where the business loss exceeds the income over the past 3 years, tax credits may be projected as far as 5 years into the future."



Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

INTERIM ADJOURNMENT: By a voice vote the House on July 2, 1964, adopted H. Con. Res. 321, to provide that when the House adjourns on July 2 it stands adjourned until July 20. On the same date, the Senate also adopted H. Con. Res. 321, with an amendment to provide that when the Senate adjourns July 10, it be until July 20. Both the House and Senate reconvened on July 20.

ALASKA DISASTER: Alaska Earthquake Insurance (Hearings before the Committee on Interior and Insular Affairs, United States Senate, 88th Congress, 2nd Session), 163 pp., printed. Contains hearings held on April 14, 15, and May 5, 1964, on S. 2719, to amend the Alaska Statehood Act, to provide Federally-sponsored insurance protection against losses from earthquake and earthquake-related damage to real and personal property in the State of Alaska; contents of the bill; reports from various organizations, individuals, Senators, Congressmen, and Federal, State, and industry officials. Also contains a summary of major assistance measures adopted and proposed to assist Alaska.

On June 9, 1964, Senator Gruening in the Senate was granted permission to insert in that day's Congressional Record (pages 12665-12667) an article titled "Alaska: A Thorough Postmortem on Earthquake Urged on Behalf of Both Science, Reconstruction," which appeared in the May 1 issue of *Science*.

On June 12, 1964, Senator Gruening spoke in the Senate concerning interest rates for Alaska disaster loans. The Senator inserted in that day's Congressional Record (page 13114) a statement of policy adopted by the executive committee of the American Legion, Department of Alaska.

On July 6, 1964, Senator Gruening spoke to the Senate concerning the recent Alaska earthquake. At the request of the Senator a statement by M. L. Grange, President of the Greater Soldotna Chamber of Commerce, was printed in the Congressional Record (pp. 15478-15479). The statement discussed economic conditions on the Kenai Peninsula after the earthquake.

ALASKA OMNIBUS ACT AMENDMENT: Alaska Reconstruction (Hearing before the Committee on Interior and Insular Affairs, United States Senate, 88th Congress, 2nd Session), 66 pp., printed. Contains hearing held June 3, 1964, on S. 2881, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes; contents of the bill; reports on communications from various organizations, individuals, Senators, and Federal, state, and industry officials. Also contains cost summary of Alaska urban renewal disaster projects.

On June 11, 1964, the Subcommittee on Territorial and Insular Affairs of the House Committee on Interior and Insular Affairs ordered reportedly favorably to the full committee, H. R. 11438, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the March earthquake and subsequent seismic waves. The Subcommittee received testimony from Department of the Interior officials and public witnesses.

On June 16, 1964, the Senate Committee on Interior and Insular Affairs ordered reported favorably with amendments S. 2881, providing assistance to Alaska for reconstruction of damage from the recent earthquake.

The House Committee on Interior and Insular Affairs ordered reported favorably to the House on June 18, 1964, H. R. 11438. On June 30, 1964, the Senate passed with committee amendments, S. 2881. On June 29, the House Committee on Interior and Insular Affairs (H. Rept. 1521) favorably reported to the House with an amendment H. R. 11438, referred to the Committee of Whole House on the State of the Union.

H. Rept. 1521, Amending the Alaska Omnibus Act to Provide Assistance to the State of Alaska for the Reconstruction of Areas Damaged by the Earthquake of March 1964 and Subsequent Seismic Waves (June 29, 1964, report from the Committee on Interior and Insular Affairs, United States House of Representatives, 88th Congress, 2nd Session), 25 pp., printed. The Committee recommended passage (with amendments) of H. R. 11438. Contains the purpose, section-by-section analysis, and need of the bill; amendments, executive recommendations, and changes in existing law.

The Senate Committee on Interior and Insular Affairs on June 25, 1964, favorably reported to the Senate S. 2881 (S. Rept. 1117).

S. Rept. 1117, Alaska Earthquake Reconstruction (June 25, 1964, report from the Committee on Interior and Insular Affairs, United States Senate, 88th Congress 2nd Session), to accompany S. 2881, 34 pp., printed. The Committee recommended passage (with amendments) of

S. 2881, to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes. Contains the purpose of the bill, explanation of provisions, background, section-by-section analysis, changes in existing law, and individual views of Senator Gruening.

On June 29, 1964, the Senate considered S. 2881; no action was taken on the bill.

ANADRAPOUS FISH CONSERVATION: On June 25, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries ordered reported favorably to the full Committee H. R. 2392, with amendments. The amendments would require 50-50 matching funds by the states concerned and recommendations by the Secretary of the Interior to the Secretary of Health, Education, and Welfare concerning the elimination or reduction of the detrimental effects of polluting substances on fish and wildlife when information concerning such pollution is developed in studies under this Act or the Fish and Wildlife Coordination Act.

ANTIDUMPING ACT AMENDMENT: H. R. 11617 (Keith) introduced in the House, June 16, 1964, to amend the Antidumping Act of 1921; also, on June 22, H. R. 11681 (Matthews) introduced in the House; on June 29, 1964, H. R. 11823 (Pepper) was introduced in the House; referred to the Committee on Ways and Means. The remarks of the Congressman (Keith) in introducing his bill appear in that day's Congressional Record (p. 13531).

COMMERCIAL FISHERIES FUND: On June 25, 1964, Senator Bartlett spoke in the Senate concerning the amendment to the Interior Department appropriations bill which would add \$400,000 to the appropriation, and would make that sum available for emergency allocations pursuant to section 4(b) of Public Law 88-309 (S. 627) for aiding the fisheries of the Great Lakes area.

FISH AND CANNERY WORKERS' RESOLUTION ON FISHERIES: On July 2, 1964, Congressman Wilson spoke from the floor of the House inserting a resolution (Congressional Record, p. 15408) adopted by the fish and cannery workers special legislative conference held by the Seafarers International Union of North America. The resolution asks that the well being of the American workers be considered when decisions are made, when treaties are talked, and when actions are taken that could affect American fisheries. The fisheries workers want a voice in consideration of fisheries agreements.

FOOD MARKETING NATIONAL COMMISSION: National Commission on Food Marketing (Hearings before the Committee on Agriculture, United States House of Representatives, 88th Congress, 2nd Session), Serial 55, 150 pp., printed. Contains hearings held May 5, 6, and 7, 1964, on H. J. Res. 977, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer; includes text of the resolution; statements and communications from Federal and industry officials, representatives of associations and unions; Congressmen; and list of cases on price rigging, price discrimination.

Senator Magnuson spoke in the Senate on June 12, 1964, concerning the amendment by the House to S. J. Res. 71, to establish a National Commission on Food Marketing to study the food industry

from the producer to the consumer (Congressional Record, pp. 13158-13160).

On June 15, 1964, the Senate requested the return of S. J. Res. 71. The House complied with the request from the Senate and returned the joint resolution.

On June 19, 1964, the Senate concurred in House amendments to S. J. Res. 71, thus clearing the bill for the President's signature. Prior to that action, Senate rescinded its action of June 5, 1964, in agreeing to hold a conference with House on the bill and appointing conferees.

On June 23, 1964, Senator McGovern spoke from the floor of the Senate concerning the passage of the Senate of S. J. Res. 71 (Congressional Record, p. 14236).

On July 1, 1964, the Senate announced the appointment as Senate members of the National Commission on Food Marketing (created by Senate Joint Resolution 71), Senators Magnuson (Washington), McGee (Wyoming), Hart (Michigan), Morton (Kentucky), and Hruska (Nebraska). House members appointed are: Mrs. Sullivan (Mo.), Purcell (Tex.), Rosenthal (N. Y.), Cunningham (Nebr.), and Mrs. May (Wash.).

On July 3, 1964, the President signed S. J. Res. 71, (P. L. 88-354). Authorizes a 15-member Commission on Food Marketing. Provides for five appointees by the President, five Senators, and five Congressmen. Study will encompass food-price fluctuations, marketing procedures, and business relationships among farmers, processors, and retail outlets. The duties of the Commission are described as follows: "The Commission shall study and appraise the marketing structure of the food industry including the following: (1) the actual changes in the various segments of the food industry; (2) the changes likely to materialize if present trends continue; (3) the kind of food industry that would assure efficiency of production, assembly, processing and distribution, provide appropriate services to consumer; (4) the changes in statutes or public policy, the organization of farming and food assembly, processing, and distribution, and inter-relationships between segments of the food industry which would be appropriate to achieve a desired distribution of power as well as desired levels of efficiency; and (5) the effectiveness of the services and regulatory activities of the Federal Government in terms of present and probable development in the industry." Commission's report must be submitted by July 1, 1965. A budget of \$1.5 million is authorized.

The President picked Judge Marvin Jones to serve as Chairman; also appointed to the Commission: Fred Marshall of Grove City, Minn.; Albert Mitchell, New Mexico cattleman; William M. Batten, J. C. Penny Co. President; and Elmer R. Kiehl, an educator from Missouri Senate.

INTERIOR DEPARTMENT APPROPRIATIONS, FY 1965: H. Rept. 1519, Department of the Interior and Related Agencies Appropriation Bill, 1965 (June 26, 1964, report from the Committee of Conference, 88th Congress, 2nd Session), 11 pp., printed. The Committee reported agreement on amendments to H. R. 10433, making appropriations for the fiscal year ending June 30, 1965 and for other purposes. Contains amendments to the bill and general statements.

On June 22, 1964, the Senate considered H. R. 10433, fiscal year 1965 appropriations for the Department of the Interior, and related agencies, and adopted all committee amendments en bloc, which were then considered

as original text for the purpose of further amendment. No final action was taken on the bill. This bill includes funds for the U. S. Fish and Wildlife Service and its two bureaus--Commercial Fisheries, and Sport Fisheries and Wildlife.

The Senate on June 23 passed with amendments H. R. 10433, after adopting Hart amendment to provide \$400,000 for rehabilitation of the Great Lakes fisheries; asked for a conference with the House and appointed conferees.

On June 24, 1964, a message was received from the Senate announcing that the Senate had passed, with amendments in which the concurrence of the House was requested, H. R. 10433. The message also announced that the Senate insisted upon its amendments and appointed conferees.

The House on June 25, 1964, disagreed to the Senate amendments to H. R. 10433; agreed to a conference requested by the Senate; and appointed conferees. The conferees were scheduled to meet in executive session on June 26.

Pursuant to an order of the House on June 25, the conference report (H. Rept. 1519) on H. R. 10433, was printed in the Congressional Record of June 26. Included in the report for the Bureau of Commercial Fisheries are: Amendments Nos. 20 and 21, appropriating \$18,819,900 for management and investigations of resources instead of \$17,832,000 as proposed by the House and \$19,069,900 as proposed by the Senate. The increase over the House bill includes: \$87,000 for a vessel and additional reservoir research in South Da-

kota; \$50,000 for more adequate management and enforcement of fishing regulations in international waters; \$50,000 for initiation of a research program on shellfish processing and utilization at Ketchikan, Alaska; \$200,000 for initiation of a research program on North Atlantic lobsters; \$200,000 for initiation of a program to survey and research the sea clam; and \$400,000 to provide financial assistance, under section 4(b) of Public Law 88-309, to the Great Lakes commercial fishing industry. Included in the report for the Bureau of Sport Fisheries and Wildlife are: Amendment No. 22, appropriating \$33,810,000 for management and investigation of resources instead of \$33,550,000 as proposed by the House and \$34,330,000 as proposed by the Senate. The net increase over the House bill includes, among others, establishment of a cooperative fishery unit at the University of Arizona, \$30,000; expansion of North Central Reservoir Research, \$45,000; and a vessel and experimental facilities at the Sandy Hook Marine Laboratory, N. J., \$175,000. Also Amendment No. 23, appropriating \$7,016,200 for construction instead of \$6,074,700 as proposed by the House and \$7,275,300 as proposed by the Senate.

On June 29, 1964, the House, by a voice vote, adopted the conference report on H. R. 10433 and sent the legislation to the Senate. The Senate on the same date also adopted the conference report on H. R. 10433. This action cleared bill for the President. As provided by the conference report and passed by the Senate and House, the bill provides funds for the Fish and Wildlife Service as shown in the table.

On July 7, 1964, the President signed H. R. 10433 (Public Law 88-356).

Fish and Wildlife Service Appropriations for Fiscal Year 1964, and for Fiscal Year 1965: Budget Estimate, the House Allowance, the Senate Allowance, and the Conference Allowance

Item	Approp. FY 1964	Budget est. 1965 & 1964 Supplementals	House Allow.	Senate Allow.	Conf. Allow.
Fish and Wildlife Service:					
Office of the Commissioner of Fish and Wildlife:					
Salaries and expenses,	386,000	393,000	425,000	425,000	425,000
Bureau of Commercial Fisheries:					
Mgt. & inv. of res.	17,832,900	20,631,000	17,832,900	19,069,900	18,819,900
Mgt. & inv. of res. (appropriation of receipts),	-	-	(2,125,000)	(2,125,000)	(2,125,000)
Mgt. & inv. of res. (1964 supplemental estimate),	-	100,000	-	-	-
Mgt. & inv. of res. (special foreign currency program),	300,000	300,000	300,000	300,000	300,000
Construction,	5,100,000	4,788,000	4,788,000	4,788,000	4,788,000
Construction of fishing vessels . . .	750,000	-	-	-	-
General administrative expenses . . .	653,000	676,000	667,000	667,000	667,000
Administration of Fribilof Islands (appropriation of receipts),	(2,468,000)	(2,442,000)	(2,442,000)	(2,442,000)	(2,442,000)
Limitation of administrative expenses, fisheries loan fund	(270,000)	(277,000)	(277,000)	(277,000)	(277,000)
Total, Bureau of Commercial Fisheries,	24,635,900	26,495,000	23,587,900	24,824,900	24,574,900
Bureau of Sport Fisheries & Wildlife:					
Mgt. & inv. of res.	30,529,900	34,359,000	33,550,000	34,330,000	33,810,000
Mgt. & inv. of res. (1964 supplemental estimate),	-	300,000	-	-	-
Construction,	5,293,500	3,593,000	6,074,700	7,275,300	7,016,200
Migratory bird conservation account, .	10,000,000	8,000,000	8,000,000	8,000,000	8,000,000
General administrative expenses, . . .	1,359,000	1,384,000	1,384,000	1,384,000	1,384,000
Total, Bureau of Sport Fisheries & Wildlife,	47,182,400	47,636,000	49,008,700	50,989,300	50,210,200
Total, Fish and Wildlife Service, . .	72,204,300	74,524,000	73,021,600	76,239,200	75,210,100

Note: Figures in parentheses are not included in totals since they are not one-year funds.

INTERNATIONAL CONVENTION FOR THE NORTH-WEST ATLANTIC FISHERIES: By unanimous consent on June 22, 1964, it was agreed that a ye-a-and-nay vote would be taken on June 23, on the question of adoption of the resolution of ratification concerning Protocol relating to harp and hood seals, proposed to the International Convention for the Northwest Atlantic Fisheries, signed at Washington, D. C., on February 8, 1949 (Ex. B, 88th Cong., 2nd sess.).

By unanimous vote of 83 yeas the Senate on June 23 adopted the resolution of ratification.

MEDICAL CARE FOR VESSEL OWNERS: On July 2, 1964, the House Committee on Rules reported (Rept. 1540) H. Res. 799, providing for the consideration of and 1 hour of debate on H. R. 3873, to permit certain owners of fishing boats to receive medical care and hospitalization without charge at Public Health Service hospitals.

OCEANOGRAPHY: Extension of remarks of Senator Magnuson inserting an address by Dr. Athelstan Spilhaus at a banquet held in Washington, D. C., on June 17, highlighting the first Navy symposium on military oceanography. The address was titled "Man in the Sea." (Congressional Record, pp. A3374-75.)

The Subcommittee on Oceanography of the House Committee on Merchant Marine and Fisheries met June 23, 24, and 25 on proposed suggestions on the fiscal year 1965 report on oceanographic program. On June 24, 1964, the Subcommittee continued a discussion of oceanography with testimony given by James H. Wakelin, Assistant Secretary of the Navy, and Chairman of the Interagency Committee on Oceanography. Wakelin was also accompanied by D. L. McKernan and Dr. A. E. Maxwell, members of the Interagency Committee on Oceanography. They reported on the progress and accomplishments of the ICO since the previous hearings in 1962. Bureau Director McKernan testified as Chairman of the Instrumentation, Equipment, and Facilities Panel of the ICO.

On June 30, 1964, the Subcommittee continued hearings on oceanography, and received testimony from other Government witnesses.

PESTICIDES COORDINATION: Administration of Pesticide Laws and Regulations (Hearing before the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), Serial RR, 42 pp., printed. Contains hearing held on May 26, 1964, on the operation of the pesticide and insecticide laws and regulations; statements made by various Federal Officials; and information on interdepartmental coordination of activities relating to pesticides.

On June 12, 1964, Senator Dirksen spoke in the Senate concerning the U. S. Public Health Service conference in New Orleans regarding fish losses in the Mississippi River. The Senator inserted in that day's Congressional Record (pp. 13186-13187) a trade publication editorial discussing the conference.

Speaking in the Senate on June 18, 1964, Senator Ribicoff announced that the Subcommittee on Reorganization and International Organizations of the Senate Committee on Government Operations would resume its hearings on the role of Government in pesticide use, regulation, and research. The purpose of the hearings would be to consider the U. S. Public Health Service in-

vestigation of the recent Mississippi River fish kill. Senator Ribicoff summarized previous investigative actions concerning the Mississippi River fish kill and outlined conflicting opinions regarding the incident. (Congressional Record, p. 13754, June 18, 1964.)

The subcommittee on Reorganization and International Organization of the Senate Committee on Government Operations resumed its hearings on June 29 on interagency coordination of environmental hazards, with special regard to the buildup of pesticides in water sources and the general environment. Testimony was received from officials of the Public Health Service, Department of Health, Education, and Welfare, and the Agricultural Research Service, Department of Agriculture. Testimony concerned the recent fish kill in the Mississippi River. The purpose was to determine the facts behind charges of the chemical industry that they were not allowed to present adequately their side of the case involving marine fish kills attributed to pesticides in the lower Mississippi River at the Public Health Service hearing in New Orleans on May 5 and 6, 1964. Hearings were adjourned until sometime after July 20, 1964, when representatives of the chemical industry were to present testimony.

Congressman Beermann on June 17, 1964, under an extension of remarks, commented on the conflicting opinions concerning pesticides and fish losses in the Mississippi River. Two newspaper articles discussing pesticides, fish, and wildlife were included in the Congressman's remarks. (Congressional Record, Appendix pp. A3305-3306, June 17, 1964.)

On June 22, 1964, the Senate passed S. 1251 with committee amendments. The title was amended to read: "To amend the act of August 1, 1958, as amended, to increase the authorization for pesticide research by the Secretary of the Interior." This bill is a companion to H. R. 4487 (Dingell) which is pending before the House.

Congressman Broyhill under extension of remarks inserted in the Congressional Record, of July 6, 1964 (p. A3650) a statement by Mrs. Ruth G. Desmond of the Federation of Homemakers (given at a public hearing on the Mississippi River fish kill conducted by the Department of Agriculture), regarding the hazards of pesticides generally and the fish kill incident in the Louisiana area.

H. R. 4487 and S. 1251 would increase authorized appropriations for research into the effects of pesticides on fish and wildlife. Both bills would raise authorized annual appropriations from the existing \$2,565,000 to \$3.2 million in fiscal year 1965 and to \$5 million thereafter.

H. R. 4487 would require that each package of pesticide carry instructions as to how injury to fish and wildlife could be prevented. The bill would authorize the Secretary of the Interior "to operate and maintain existing facilities for the purpose of determining whether chemicals proposed to be used are harmful to fish and wildlife and to distribute this information to interested persons or agencies, both private and public." The Senate Committee on Commerce struck this provision from S. 1251, because Federal agencies have agreed to cooperate in getting cautionary wording on pesticides labels under the framework of existing law.

STATE REGULATION OF CONTINENTAL SHELF FISHERIES RESOURCES: S. 2903 (Bartlett) introduced in the Senate June 11, 1964, to provide for the conserva-

tion of certain fishery resources on the seabed or in the subsoil of the Outer Continental Shelf; referred to the Committee on Commerce. Senator Bartlett remarked that this is a bill to clarify the States' regulatory jurisdiction over Continental Shelf fishery resources; and that the bill would assign responsibilities for the fishery resources of the Continental Shelf to the several States.

The Senator said, "States should be formally and effectively enabled to regulate their Continental Shelf fisheries just as they do their other fisheries. Federal legislation of this nature should be consistent with congressional policy, as expressed in the Submerged Lands Act and the Outer Continental Shelf Lands Act of 1954. These acts confirm State jurisdiction over fishery resources within territorial waters. My bill would simply extend this jurisdiction to cover fishery resources of the Continental Shelf outside territorial waters. . . . Jurisdiction over fishery resources, of course, implies only the responsibility for managing the resources so that they will be conserved and developed for the benefit of present and future generations. Since the States are currently responsible for the resources within territorial waters and on the seabed beneath these waters, it seems logical and practical to extend this responsibility to the Outer Continental Shelf. Otherwise, split jurisdictions would result from Federal management of resources adjacent to those under State control. . . ." (Congressional Record, pp. 12958-12959.)

SUPPLEMENTAL APPROPRIATIONS FY 1964: On June 9, H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, was signed by the President (Public Law 88-317). The bill appropriates an additional \$47,162,000 for the Department of the Interior, including \$650,000 for the repair and replacement of Bureau of Commercial Fisheries' facilities and equipment damaged in the Alaska earthquake.

TERRITORIAL WATERS OF THE UNITED STATES: Rep. Pelly spoke in the House concerning Soviet fishing vessels attempting to run American halibut fishermen off traditional American fishing grounds in the Gulf of Alaska. (Congressional Record, p. 14138.)

TRADE EXPANSION ACT AMENDMENT: H. R. 11744; H. R. 11761 through H. R. 11811, introduced on June 25 in the House, bills to amend the Trade Expansion Act of 1962; referred to Committee on Ways and Means. Congressman Pillion spoke in the House on June 25, inserting the text of H. R. 11797, an explanation of its provisions, and a summary explanation of the criteria contained in the bill. The Congressman pointed out that the bills are designed to minimize the number of import items that can be the subject of negotiated tariff cuts or concessions, and establishes specific statutory criteria and degrees of damage resulting from foreign imports. If a segment of industry or labor suffers the prescribed degree of damage, its product will become manadatorily reserved from further tariff reduction negotiations. Included in the partial list of products cited by Congressman Pillion as qualifying for protection are fishery products. Other Congressmen also spoke in the House concerning these bills. (Congressional Record, pp. 14508-14527.) On June 29, H. R. 11825 (Secrest) and June 30, H. R. 11833 (Baring) and H. R. 11848 (Riehlman) were introduced in the House; similar to H. R. 11797; referred to the Committee on Ways and Means.

VESSEL CONSTRUCTION SUBSIDY AMENDMENT: Fishing Vessel Subsidies Part 2 (Hearing before the Subcommittee on Fisheries and Wildlife Conservation, Committee on Merchant Marine and Fisheries, United States House of Representatives, 88th Congress, 1st Session), 171 pp., printed. Contains hearings held November 13, 1963, on H. R. 2172, H. R. 2743, and S. 1006, to amend the Act of June 12, 1960, for the correction of inequities in the construction of Fishing Vessels, and for other purposes; including text of S. 1006; reports from various Federal agencies; and statements and communications from Federal, industry, and association officials.

On June 10, 1964, the Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries ordered reported favorably to the full Committee S. 1006 (amended), to amend the U. S. Fishing Fleet Improvements Act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. (This bill passed the Senate on October 2, 1963.)

On June 18, 1964, the House Committee on Merchant Marine and Fisheries ordered reported to the House S. 1006 (amended). The Committee retained the Subcommittee's amendments which would reduce the maximum commercial fishing vessel construction subsidy to be available from 55 to 50 percent, and that a subsidy be granted only "after notice and hearing." Also, the House Committee extended the period for the subsidy from June 30, 1968, to June 30, 1969; and added an amendment to Sec. 9 of the 1960 law which inserts language that would give the Secretary flexibility to allow the transfer of subsidized vessels under certain conditions to another fishery after notice and hearing.

On June 30, 1964, the House Committee on Merchant Marine and Fisheries reported to the House, S. 1006, with amendment (H. Rept. 1524); referred to the Committee of the Whole House on the State of the Union.

H. Rept. 1524, Fishing Vessel Construction (June 30, 1964, report from the Committee on Merchant Marine and Fisheries, United States House of Representatives, 88th Congress, 2nd Session, to accompany S. 1006), 25 pp., printed. The Committee recommended passage (with amendments) of S. 1006, to amend the act of June 12, 1960, for the correction of inequities in the construction of fishing vessels, and for other purposes. Contains the purpose, need, section-by-section analysis of the bill, departmental reports, changes in existing law, and minority views.

VESSEL ENGAGED IN FISHERIES: The House Committee on Merchant Marine and Fisheries on June 23 favorably reported without amendment H. R. 6007, a bill to permit the vessel SC-1473 to engage in the fisheries.

On June 25, 1964, the House passed by a voice vote H. R. 6007, to document under the American flag, for fishing purposes, a vessel (SC-1473) that was built during World War II by the Navy through a subcontractor in Canada and which is a derelict in the Charleston Harbor.

WATER POLLUTION: On June 26, 1964, Senator Muskie spoke to the Senate about the prevention, control, and abatement of water pollution. He mentioned the massive fish kills which have taken place in the fall and winter months of every year since 1960, in the lower Mississippi and Atchafalaya Rivers and the Gulf of Mexico. The Senator discussed the technical report of the

U.S. Department of Health, Education, and Welfare on the fish kills in question, and the points at issue between the Government and industry (Congressional Record, June 26, pp. 14680-14682).

On July 2, 1964, Congressman Curtis spoke in the House concerning the problem of water pollution and the efforts of the American chemical industry on the preservation of water quality. He pointed out that the industry in June embarked upon an extensive research program to determine how organic chemicals act in streams, lakes, and rivers, and how treatment processes for sanitary sewage react upon those chemicals (Congressional Record, July 2, 1964, pp. 15385-15386).

WATER RESOURCES COUNCIL: Water Resources Planning Act (Hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, House of Representatives, 88th Congress, 2nd Session), 241 pp., printed. Contains

hearings held March 23, 24, 26, and April 20, 1964, on S. 1111 and H. R. 3620, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a Water Resources Council and River Basin Commission, and by providing financial assistance to the States in order to increase state participation in such planning; contents of the bills; reports from various departments, individuals; Senators, Congressmen, and Federal and State officials.

On June 23, 1964, the Senate Committee on Interior and Insular Affairs' Subcommittee on Irrigation and Reclamation met in executive session on S. 1111, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission. No action was taken.



JAPANESE RAFT CULTURE OF OYSTERS

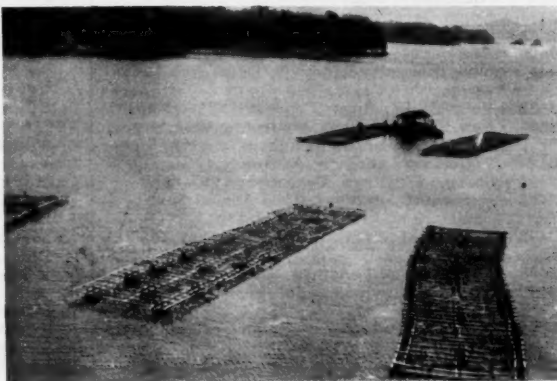
Japan has made remarkable progress in raft oyster culture in recent years. The Japanese usually anchor their oyster rafts 25 or 30 miles from population centers.

Wires to which scallop shells have been affixed are suspended from the rafts and oysters attach themselves to the shells, providing a crop which is easy to inventory and readily harvested.

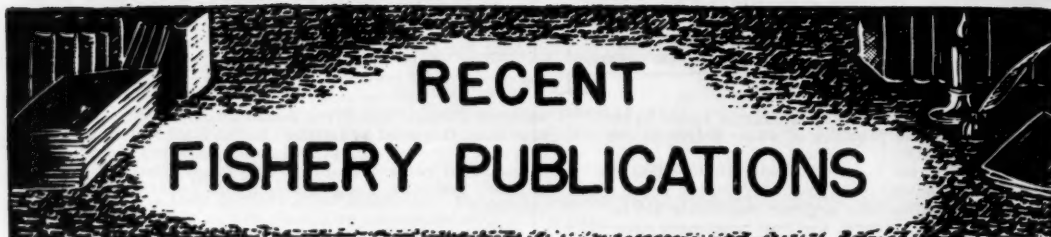
The rafts with their burdens of oysters may be moved from one area to another in case of pollution.

This method now accounts for more than 85 percent of Japan's oyster culture, a 70-percent increase within the past 10 years. And overall production through culture has more than doubled.

Total production of one raft over a period of approximately nine months may be as much as 200 bushels, or about one-half bushel per wire. (Australian Fisheries Newsletter, June 1964.)



Oyster-culture rafts anchored in a deep protected bay.



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CFS-3438	- Fish Meal and Oil, January 1964, 2 pp.
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CFS-3481	- North Carolina Landings, 1963 Annual Summary, 9 pp.
CFS-3483	- New Jersey Landings, February 1964, 3 pp.
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CFS-3489	- Virginia Landings, February 1964, 3 pp.
CFS-3491	- New York Landings, February 1964, 4 pp.
CFS-3492	- Wisconsin Landings, February 1964, 2 pp.
CFS-3493	- Louisiana Landings, February 1964, 3 pp.
CFS-3494	- Shrimp Landings, December 1963, 8 pp.
CFS-3495	- Wisconsin Landings, 1963 Annual Summary, 3 pp.
CFS-3496	- Gulf Coast Shrimp Data, December 1963, 20 pp.
CFS-3498	- Rhode Island Landings, January 1964, 3 pp.
CFS-3499	- Alabama Landings, 1963 Annual Summary, 7 pp.
CFS-3502	- Georgia Landings, 1963 Annual Summary, 9 pp.
CFS-3503	- California Landings, February 1964, 4 pp.
CFS-3504	- North Carolina Landings, March 1964, 4 pp.
CFS-3506	- Florida Landings, March 1964, 8 pp.
CFS-3508	- Massachusetts Landings, by Ports, 1963 Annual Summary, 14 pp.
CFS-3510	- Michigan Landings, February 1964, 3 pp.
CFS-3511	- Mississippi Landings, 1963 Annual Summary, 6 pp.

Number	Title
CFS-3512	- Fish Meal and Oil, February 1964, 2 pp.
CFS-3513	- Louisiana Landings, March 1964, 3 pp.
CFS-3514	- New York Landings, March 1964, 4 pp.
CFS-3516	- Maryland Landings, March 1964, 3 pp.
CFS-3518	- Fish Meal and Oil, March 1964, 2 pp.
CFS-3519	- North Carolina Landings, April 1964, 4 pp.
CFS-3520	- Shrimp Landings, 1963 Annual Summary, 16 pp.
CFS-3522	- Maine Landings, March 1964, 4 pp.
CFS-3524	- Florida Landings, April 1964, 8 pp.
Sep. No. 705	- Improved Rapid Method for Determining Total Lipids in Fish Meal

Sep. No. 706 - Soviet Fishing Industry

SSR-Fish. No. 480 - Further Studies of Protein and Calorie Levels of Meat-Meal, Vitamin-Supplemented Salmon Diets, by Laurie G. Fowler, J. Howard McCormick, Jr., and Allan E. Thomas, 15 pp., February 1964.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL - 87	- Survey of the Dominant Conditions Affecting the Development of the Cartagena (Colombia) Fishery, 58 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, April and May 1964, 14 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, February, March, and April 1964, 13, 14, and 14 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014,

Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf Fisheries (Selected Areas) - 1963, by E. J. Barry, 42 pp., illus., June 1964. (Market News Service, U. S. Fish and Wildlife Service, 600 South St., New Orleans, La. 70130.) Summarizes the commercial landings of fish and shellfish for selected areas of the Gulf States of Florida (West Coast), Alabama, Mississippi, Louisiana, and Texas. The tables show landings for only the specific areas designated and cannot be interpreted as representing the total landings for a given State. However, the data do give an indication of general trends. Part I reports on developments and conditions in Gulf Coast fisheries during 1963 and gives a resume of the individual fisheries. Discusses the shrimp fishery in detail; production and market conditions for the oyster, blue crab, and finfish fisheries; as well as imports of fresh and frozen fish and shellfish. Part II includes statistical tables showing total fishery products landings; crab meat production by areas and months; and menhaden landings and production of fish meal, oil, and solubles. It also gives data on fishery imports through the New Orleans and Morgan City, La., Customs Districts, Port Isabel-Brownsville and Houston, Tex., and Mobile, Ala.; and LCL express shipments from New Orleans for 1963 by months and destination. Also included are tables showing monthly range of wholesale prices of fishery products on the New Orleans French Market; Gulf States oyster and shrimp packs, 1962/63 season and packs by seasons 1958-63; and fishery products market classifications in the Gulf Area.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, April 1964, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Annual Summary, 1963, by Robert A. Hall and Henry R. McAvoy, 52 pp., illus., May 1964. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Reviews the fishery marketing trends and conditions at the principal New England ports,

and highlights of the fisheries in other areas and competitive foreign countries. The latest developments in the purse-seine tuna, swordfish long-line, and offshore lobster fisheries are also reviewed. The fishery industries at the principal ports produced less food and industrial fish in 1963, but an exceptionally lucrative catch at New Bedford caused a higher total ex-vessel value than in 1962. The summary covers food-fish landings by ports and species; industrial fish landings and ex-vessel prices; fishing vessel news; imports; frozen fishery products; the fish-meal market; Canadian plans to extend Fishing Limits to 12 miles; and other information. Also includes fishery landings and ex-vessel prices for ports of Boston, Gloucester, New Bedford, Provincetown, Portland, Rockland, Point Judith, and Stonington; highlights of the Maine sardine fishery; events in the fisheries of Canada, Denmark, Iceland, Japan, and Peru; and historical data of fisheries at principal New England ports. In addition, contains data on monthly landings and ex-vessel prices, by species at Boston and Atlantic Ave. fish piers.

New England Fisheries--Monthly Summary, April 1964, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1964, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AMINO ACIDS:

"Chromatographic determination of amino acids in fish stickwater," by Yu. A. Vorotnikov, article, Chem-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ical Abstracts, vol. 57, July 23, 1962, 2636f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"2-Aminoethylphosphonic acid in insoluble protein of the sea anemone *Metridium dianthus*," by Louis D. Quin, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1133-1134, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

ANCHOVY:

"The ripening process of anchovy," by F. Alm, article SIK-Rapport, no. 123, 1962, p. 41, printed in Swedish. Svenska Institutet for Konserverings-Forskning, Kalleback 1, Goteborg, Sweden.

AQUATIC PLANTS:

"Control of aquatic plants big problem," by Joe Logan, article, *South Carolina Wildlife*, vol. 11, no. 2, Spring 1964, pp. 6-9, illus., printed. South Carolina Wildlife Resources Department, Box 360, Columbia, S. C.

ARGENTINA:

Establishing a Business in Argentina, by James M. von Stroebel, OBR 64-33, 20 pp., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) During the period 1960-62 the Argentine Government's economic policy was oriented toward the stimulation of private participation in industry and commerce, and of private foreign investment. This report discusses that country's investment climate, legislation governing investment, and business organization. Also covers patents, trademarks, and copyright; employment conditions; and the taxation picture.

BIOCHEMISTRY:

"Correlations between the mineral elements and protein level in fish," by E. N. Vasil'eva, N. E. Dyubyuk, and T. D. Lychnikova, article, *Chemical Abstracts*, vol. 57, November 26, 1962, p. 14302b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Isolation of a substance with antithiamine activity from carp intestines," by J. C. Somogyi and H. Kuentig-Hegedus, article, *Chemical Abstracts*, vol. 59, November 11, 1963, 11938h, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

BRINE COOLING:

"Cooling sprats in saline solutions," by L. G. Mikhailova, article, *Kholodil'naia Tekhnika*, no. 2, 1964, pp. 41-43, illus., printed in Russian, single copy 60 Kopecks (about 67 U. S. cents). Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003.

CALIFORNIA:

Inshore Fishes of California, by John L. Baxter, 80 pp., illus., printed, 35 cents, revised 1963. Printing Division, Documents Section, N. Seventh St. at Richards Blvd., Sacramento, Calif. 95814.

CANADA:

"Canada's fisheries markets in 1963," by T. R. Kinsella, article, *Foreign Trade*, vol. 121, no. 10, May 16, 1964, pp. 2-8, illus., printed. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Covers briefly Canadian production, imports, and exports of fishery products during 1963. Total exports reached an all-time high of over C\$172 million. This article discusses exports and production of fresh and frozen fish, salted and canned fish, molluscs and crustaceans, and fish meal and oil. Mentions research conducted by the Fisheries Research Board of Canada in perfecting a fish flour for human consumption.

Fisheries Statistics, Manitoba, 1962, Catalogue No. 24-210, 10 pp., processed in French and English, March 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish landed in Manitoba, 1955-1962; quantity and value of landings by species and fisheries districts, 1961-1962; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Ontario, 1962, Catalogue No. 24-209, 11 pp., illus., processed in French and English, April 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains tables giving the value of fish landed in Ontario, 1955-1962; quantity and value of landings by species and fisheries districts, 1961-1962; capital equipment used in the primary fisheries operations; number of persons engaged in the fisheries; and new capital investment in the commercial fishery.

Fisheries Statistics, Saskatchewan, 1962, Catalogue No. 24-211, 8 pp., processed in French and English, April 1964, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains data on the value of fish landed in Saskatchewan, 1955-1962; quantity and value of landings by species, 1961-1962; quantity and value of landings by major species and by lakes; capital equipment in primary fisheries operations; and the number of persons engaged in the primary fisheries.

CHEMICAL COMPOSITION:

"The environment for chemical change in dried and frozen foods," by R. B. Duckworth and G. M. Smith, article, *Proceedings of the Nutrition Society*, vol. 22, no. 2, 1963, pp. 182-189, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

COLD STORAGE:

"Cold storage of cod fillets treated with polyphosphates," by Eiichi Tanikawa, Minoru Akiba, and Akira Shitamori, article, *Food Technology*, vol. 17, November 1963, pp. 87-92, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

COLOMBIA:

Basic Data on the Economy of Colombia, by Herbert A. Lindow, OBR 64-35, 24 pp., illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Although some declines in agricultural production and high food prices may have a retarding effect, there

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are good possibilities that Colombian economic growth in 1964 will exceed the 5 percent rate registered in 1963. The report discusses general features of the country—geography, population, and government; government representation between Colombia and the United States; structure of the economy; agriculture; mineral resources; and manufacturing. Also covers power, transportation and communications, labor force, finance, foreign trade, the government's role in the economy, and the Alliance for Progress. A short section discusses the Pacific Coast and Magdalena River fishery resources, and exports of Colombian shrimp to the United States.

COMMUNIST CHINA:

Sea Fisheries in Communist China, by Shigeaki Shindo, Overseas Fisheries Series No. 2, 38 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

CONSERVATION:

Conserving American Resources (Second Edition), by Ruben L. Parson, 533 pp., illus., printed, 1964, \$8.95. Prentice-Hall, Inc., Englewood Cliffs, N. J. 07632. The population explosion is something that we are continually reading about, and one of the resulting problems is conservation of our natural resources. Our major natural resources and the interrelationship among all resources are discussed very adequately in this book. In the preface the author emphasizes that more busy Americans can and should become interested in the story of our national resources and the ways they can be conserved. How resource conservation is the real connecting link between natural and social sciences is explained by the author. Not only facts and figures are to be found in the book, but also concepts. Presented is the latest thinking on such topics as Federal aid in fish and wildlife rehabilitation, multiple use of forest land, the economic plight of the commercial fisheries, land reserves, wetlands for ducks, and management of public lands. The author very ably points out: "What follows is largely an attempt to acquaint thinking Americans with the broad categories of natural wealth upon which their well-being depends. The treatment of each category includes a brief statement of its usefulness, a quick glance at its past history, and several suggestions for getting greater benefit from it in the future. The entire discussion is a development of concepts rather than a recitation of facts; an exhortation to think and participate rather than an exposition on statistics and techniques." In commenting on the importance of conservation to Americans, the author states that each of us should have a "whistling knowledge" of it. In discussing "The Conservation Idea," the subject of the first chapter, the author says that conservation of natural resources means the fullest possible use of them without abusing the ones exploited, without destroying any needlessly, and without neglecting any that can be used. Also, natural resources serve us every day of our lives in almost everything we do, and they are essential to our existence. But more important, our continued prosperity depends upon the wisdom with which we use them. The author takes the positive approach. Discussed in the book are the natural environment and resources; water on the land, and its conservation;

our soils and their depreciation, and their conservation; spoliation and restoration of our dry grasslands; our forests and their exploitation and conservation; conservation patterns on the land; functions and abuses of wildlife, and its conservation; resources for recreation, inspiration, and instruction; resources of our bordering seas; mineral fuels and major metals, and their conservation. The last chapter deals with prospect and responsibility and points out that conservation is the key to future prosperity. Fish and fishing, both sport and commercial, are adequately covered in view of the wide scope of the book. For example, with reference to fishery resources, the book covers propagation, control of numbers, gear and techniques, habitats, imports and exports, overfishing, restoration projects, international fisheries agreements, fisheries regulation and standardization, fish flour or fish protein concentrate, fish oil and meal, packaging and transportation, species variety, underutilization, agar, algin, fur seals, interstate fishery commissions, and much more. This partial listing shows that the author has really delved into the subject of fisheries. He has done the same with the other resources. Although an excellent book for professionals, it is not too technical for any reader interested in our Nation's resources, and who wants to learn how he may help conserve them. This is a serious subject, but the author has treated it in a lively and readable manner. Those interested in commercial fisheries will find many interesting ideas and concepts regarding our fishery resources. The appendix contains teaching aids and a good listing of current literature. Because of its excellent index and marginal notes, it is a good book to have on hand for quick reference.

--Joseph Pileggi

CRABS:

"How crabs adjust themselves to changing salinity," article, *New Scientist*, vol. 16, October 11, 1962, p. 105, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"N-ethylmaleimide inhibition of horseshoe crab hemocyte agglutination," by F. T. Bryan and others, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1147-1148, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

CRAWFISH:

"Rice farmers raise crawfish in Louisiana paddies to lift income," by Fred Zimmerman, article, *Wall Street Journal*, vol. 69, December 10, 1963, p. 1, printed. Dow, Jones & Co., Inc., 1540 Market St., San Francisco 19, Calif.

CRUSTACEANS:

Nombres vulgares y científicos de las principales especies comerciales de crustáceos de Cadiz (Common and scientific names of the principal commercial species of crustaceans at Cadiz), by Julio Rodríguez-Roda, 2 pp., printed in Spanish, 1964. (Reprinted from *Investigación Pesquera*, vol. 25, January 1964, pp. 3-4.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

DAHOMEY:

Basic Data on the Economy of Dahomey, by Donald M. Maclay, OBR 64-36, 12 pp., illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents information on Dahomey's geography and climate, form of government, and population; economic structure; agriculture and forestry; mining; industry, and power supplies. Also covers transportation, communications, finance, foreign trade; a program for economic development, marketing, and government representation between Dahomey and the United States. A short section discusses the importance of the fishing industry and potential for future development.

DOLPHIN:

"Visual problem-solving in a bottlenose dolphin," by Winthrop N. Kellogg and Charles E. Rice, article, *Science*, vol. 143, no. 3610, March 6, 1964, pp. 1052-1055, illus., printed, single copy 35 cents. American Association of the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. In the study here reported, a captive 8-year-old dolphin, well adapted to contact with human beings, was tested by the discrimination method for underwater perception of visual forms or patterns. The animal successfully discriminated 21 of the 25 pairs of stimuli presented.

DRYING:

"New accelerated fish drying method," article, *Food Manufacture*, vol. 38, December 1963, pp. 669-670, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

ENZYMES:

"Zone electrophoretic separation of five phosphoglucose mutase activities from fish muscle," by E. Roberts and H. Tsuyuki, article, *Chemical Abstracts*, vol. 59, October 28, 1963, 10389g, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

FARM PONDS:

Construction and Management of Farm Ponds in Ontario, by H. D. Ayers, H. R. McCrimmon, and A. H. Berst, Publication 515, 39 pp., printed. Ontario Department of Agriculture, Parliament Bldgs., Toronto, Canada.

FATTY ACIDS:

"Component fatty acids of the blubber fat from the common or harbor seal *Phoca vitulina concolor* de Kay," by P. M. Jangaard, R. G. Ackman, and R. D. Burgher, article, *Canadian Journal of Biochemistry and Physiology*, vol. 41, December 1963, pp. 2543-2546, printed. National Research Council, Ottawa, Canada.

"Effect of linolenic, linoleic, and oleic acids on measuring protein extractability from cod skeletal muscle with the solubility test," by Margaret L. Anderson, Frederick J. King, and Maynard A. Steinberg, article, *Journal of Food Science*, vol. 28, May-June 1963, pp. 286-288, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Gas-liquid chromatographic separation and determination of volatile fatty acids in fish meat during spoilage," by Shojiro Miyahara, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 27, January 1961, pp. 42-47, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

"The influence of dietary fatty acids and environmental temperature on the fatty acid composition of Teleost fish," by Raymond Reiser and others, article, *Journal of the American Oil Chemists' Society*, vol. 40, October 1963, pp. 507, 513, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

FISH BEHAVIOR:

Fish Migration, by David Gunston, *Wildlife Bulletin No. 33*, 3 pp., illus., printed, 1962. (Reprinted from *Louisiana Conservationist*, February 1959.) Louisiana Wildlife Life and Fisheries Commission, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

FISH COOKERY:

Louisiana Cook-Out, by Percy Viosca, Jr., *Wildlife Education Bulletin No. 31*, 15 pp., illus., printed, 1962. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. "Why go to Gloucester to enjoy a clambake at the beach? New England has no monopoly on that delightful form of recreation," states the author. This booklet describes the many types of shellfish and fish in Louisiana which are suitable for outdoor cooking. There are oysters, shrimp, river catfish, spoonbill sturgeon, carp, and crabs. Included are recipes for crab-meat stuffed peppers, smoked fish, and a spicy seafood sauce.

FISH CULTURE:

"Sea fish breeding," article, *Current Affairs Bulletin of the Indo-Pacific Fisheries Council*, no. 37, August 1963, pp. 25-26, printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Regional Office, Bangkok, Thailand.

FISHERY POLICIES:

Fishery Policies in the United Kingdom, The Federal Republic of Germany and Norway, by A. Arimatsu and B. Ikejiri, *Overseas Fisheries Series No. 3*, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

FISH MUSCLE:

"Chemical change in fish muscle during storage," by N. R. Jones, article, *Proceedings of the Nutrition Society*, vol. 22, no. 2, 1963, pp. 172-176, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

"Extractives of fish muscle. 3--Amounts, sectional distribution, and variations of fat, water-solubles, protein and moisture in cod (*Gadus morhua* L.) filets," by N. Damberg, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, July 1963, pp. 909-918, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies on muscle of aquatic animals. XXXIII--Seasonal variation of nitrogenous extractives in squid muscle," by Kinji Endo and others, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol.

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28, November 1962, pp. 1099-1103, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

FISH OILS:

"Autoxidation of fish oils. II--Changes in the carbonyl distribution of autoxidizing salmon oils," by C. Jane Wyatt and E. A. Day, article, *Journal of Food Science*, vol. 28, May-June 1963, pp. 305-312, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"The effect of some marine oils and squalene on the plasma cholesterol in chicks," by Olaf R. Braekkan, Leif Rein Njaa, and Finn Utne, article, *Fiskeridirektoratets Skrifter, Serie Teknologiske Undersøkelser*, vol. 4, no. 4, 1962, pp. 1-12, printed. Fiskeridirektoratet, Bergen, Norway.

"Identification of the major polyunsaturated C₁₆ acids of marine oils by GLC separation factors on normal and organosilicone polyesters," by R. G. Ackman and P. M. Jangaard, article, *Journal of the American Oil Chemists' Society*, vol. 40, December 1963, pp. 744-745, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

FISH SAUSAGE:

"Change of the vitamin A concentration in enriched fish sausage during storage in summer," by Akit-sugu Kenmoku and Hiroyuki Iwao, article, *Chemical Abstracts*, vol. 59, July 22, 1963, 2104d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

"Diffusion of oxygen in packed sausage," by Akira Kishimoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, August 1963, pp. 781-784, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

"Fish sausages," by Michael Lorant, article, *Food Manufacture*, vol. 38, August 1963, pp. 413-414, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

FISHWAYS:

"Evaluation of the Fish Passage Facilities at the Pelton Project on the Deschutes River in Oregon," by Robert T. Gunsolus and George J. Eicher, 133 pp., illus., printed. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland, Oreg. 97201.

FREEDOM FROM HUNGER:

"Freedom from Hunger Campaign News, vol. 5, no. 31, May-June 1964, 33 pp., illus., printed. Co-Ordinator's Office, Freedom from Hunger Campaign, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. This issue is dedicated to 'the men who harvest the sea.' Contains, among others, articles on: 'The warning of the blue whale,' by Donovan B. Finn; 'Detectives of the deep,' by Peyton Johnson; 'Have whalers become too efficient?' by Mack Laing; 'Outboard motors power a 'revolution' in fishing,' 'From dugout to factoryship,' 'Tuna--the question mark of the sea,' 'Inland fishing--new

frontier for food,' 'Solution for malnourished millions?,' and 'Thriving farms on the bottom of the sea.'

FREEZE-DRYING:

"Freeze-drying: with or without vacuum," by John P. O'Meara, article, *Food Engineering*, vol. 35, September 1963, pp. 55-56, printed. Chilton Co., Chestnut and 56th Sts., Philadelphia, Pa.

"The truth about freeze drying," by Sam Martin, article, *Quick Frozen Foods*, vol. 26, no. 10, May 1964, pp. 29-32, illustrated, printed. E. W. Williams Publications, Inc., 1776 Broadway, New York 19, N. Y. Discusses the practicality of freeze-dried foods. This process offers limited competition to conventional freezing processes. Its best uses will be for instant coffee, ingredients for some dry mixes, and military foods. The author believes it will supply frozen food packers with additional markets and broaden the use of freezing equipment.

FREEZING:

"Freezing of crabmeat," by S. V. Gangal and N. G. Magar, article, *Food Technology*, vol. 17, December 1963, pp. 101-106, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

FRESH FISH:

"Factors influencing the effectiveness of fresh fish washing operations," by W. A. MacCallum, M. W. Mullan, and Isabel N. Plaunt, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, September 1963, pp. 1231-1244, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

FROZEN FISH:

"Effect of processing on public health bacteria in frozen seafoods," by H. Raj and J. Liston, article, *Food Technology*, vol. 17, October 1963, pp. 83-89, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

"Electronic defrosting of meat and fish at 35 and 2,450 Mcs. A laboratory comparison," by N. Bengtsson, article, *Food Technology*, vol. 17, October 1963, pp. 97-100, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

HERRING:

"Volatile acids in fish as an index of suitability for consumption. I--Salted herrings," by Jozef Wierchowski and Maria Severin, article, *Chemical Abstracts*, vol. 57, November 26, 1962, 14248f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

HORMONES:

"Isolation of hormone-containing particles from the neurohypophysis of the cod (*Gadus morhua*), by K. Lederis, article, *Biochemical Journal*, vol. 84, July 1962, pp. 27P-28P, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

INDIA:

"Fishing off the west coast of India," by Kare Larssen, article, *Fishing News International*, vol. 3, no. 2, April-June 1964, pp. 128, 130-131, illus., printed, single copy 6s. 6d. (about 85 U.S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

St., London EC4, England. Discusses trawling off the west coast of India, chiefly for shrimp, initiated in 1954 by the Indo-Norwegian Project. At times there is a great abundance of sardines, mackerel, tuna, pomfret, and other fish, but these species do not turn up regularly. This article covers weather conditions, fishing seasons, problems of fish location and landing, and charting of the fishing grounds by two research vessels.

INDONESIA:

Foreign Trade Regulations of Indonesia, by Virginia Webbert, OBR 64-39, illus., printed, April 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Foreign trade controls operate mainly through a licensing system requiring the surrender of exchange from exports and the issuance of combined import-exchange licenses for imports which enable the Government to link imports closely to exchange availabilities. Discusses trade and foreign exchange policy; import tariff system; sales and other internal taxes; documentation and fees; and labeling, marking, and packing requirements. Also covers special customs provisions, nontariff import trade controls, Indonesia's export controls, United States controls, and government representation between the two countries.

JAPAN:

"Fisheries research in Japan," by C. R. S. Manders, article, *Nature*, vol. 202, no. 4934, May 23, 1964, pp. 755-757, printed, single copy 4s. (about 56 U. S. cents). St. Martin's Press, 175 Fifth Ave., New York, N. Y. 10010. Discusses the evolution of the Tokai Regional Fisheries Research Laboratory, its activities, and its scientific publications.

Present Status of the Fisheries Extension Service (Technological), Fisheries Administration Series No. 2, 58 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

KOREA, REPUBLIC OF:

Foreign Trade Regulations of the Republic of Korea, by Lois J. DeNauw, OBR 64-24, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The government of the Republic of Korea maintains strict controls over foreign trade and exchange transactions in order to conserve its limited foreign exchange reserves and to provide protection and encouragement to its local developing industry. This report discusses Korea's import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also covers nontariff import trade controls, United States foreign trade controls, Korea's export controls, and diplomatic representation between the two countries.

LAVER:

On a Method of Making More Productive Fishery of the Lavers (PORPHYRA)--Engineering Ways of

Improvement and Construction, by Takeo Kurakake, Fisheries Agriculture Series No. 3, 54 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

MARINE MAMMALS:

"Observations of Odontocetes in central Californian waters," by Robert L. Brownell, Jr., article, *Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette)*, vol. 53, no. 3, March 1964, pp. 60-62, 64, 66, illus., printed. Hvalfangerforeningen, Sandefjord, Norway. Reports observations of 8 different species of odontocetes made during the summer of 1963.

MARINE OILS:

"The effects of marine animals oils and other marine products on cholesterol metabolism. A review," by Takashi Kaneda, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, April 1963, pp. 387-398, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

MOZAMBIQUE:

Basic Data on the Economy of Mozambique, by Ellen Gavrishoff, OBR 64-29, 8 pp., illus., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This Portuguese province has an extensive coastline and the territorial waters abound in a large variety of fish. A new large fishing company, formed in 1963 with a capital of \$2.8 million, expects annually to freeze some 30,000 tons of fish for export. This report discusses the form of government and population, structure of the economy, agriculture, livestock and forestry, and mining and industry. Also covers Mozambique's power and transportation situation, communications system, finance and foreign trade problems, marketing set-up; and diplomatic representation between Mozambique and the United States.

NETS:

Net Repair Manual, by Stacy V. Gebhards, 23 pp., illus., processed, 1964. Idaho Fish and Game Dept., 518 Front St., Boise, Idaho. Although most nets today are machine-tied and are purchased readymade from various companies, net repair must still be done by hand. A properly mended net can mean the difference between catching many fish or none at all. The intent of this manual is merely to acquaint the beginner with the proper procedure. Proficiency in mending can come only through practice. The manual covers trimming, weaving, section replacement, hanging, and maintenance of nets.

NORTHWEST ATLANTIC FISHERIES COMMISSION:

List of Vessels over 50 Gross Tons Fishing in the ICNAF Convention Area in 1962, 123 pp., illus., processed, January 1964. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada.

North Atlantic Fish Marking Symposium, Woods Hole, Mass., May 1961, Special Publication No. 4, 370 pp., illus., printed, 1963. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada.

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NORWAY:

"A industria de conservas de peixe Norueguesa em 1963" (The Norwegian fish canning industry in 1963), article, *Conservas de Peixe*, vol. 18, no. 216, March 1964, pp. 15-17, 28, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueira dos Anjos, 68, Lisbon, Portugal.

NORWAY LOBSTERS:

"Handling and processing Norway lobsters. Part 1--Observations on handling and processing; Part 2--Washing experiments," by P. Hovart and W. Vyncke, article, *Fishing News International*, vol. 3, no. 2, April-June 1964, pp. 117, 119, 121-122, 125, illus., printed, single copy 6s. 6d. (about 85 U.S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The work reported here was carried out as part of the research program of the Committee for Applied Scientific Research in Fisheries, Fisheries Research Station, Ostend, Belgium. These are the first two parts of a four-part article. The aim of the work was a contribution to the improvement of the handling and processing of Norway lobsters (a shrimp-like crustacean) in commercial plants. In the meantime, it was intended to study the possibilities of cooking the lobsters on the vessels directly after catching. To study the influence of some important factors on the washing effect, three series of experiments were carried out, each being repeated three times on different dates and with different samples. In particular, the influence of dipping time, water temperature, soaking before washing and hosing were studied.

OCEANOGRAPHY:

Journal du Conseil, vol. 28, no. 3, March 1964, 127 pp., illus., printed, single copy Kr. 16 (about US\$2.35). Andr. Fred. Høst & Son, Bredgade, Copenhagen, Denmark. Contains, among others, articles on: "A temperature-controlled salt-water circulating apparatus for developing fish eggs and larvae," by William E. Fahy; "Age determination in the whiting (*Merlangius merlangius* L.) by means of otoliths," by R. Gambell and J. Messtorff; "On the influence of the fishery upon the population structure of redfish (*Sebastes marinus* L. and *Sebastes mentella* Travin)," by V. P. Sorokin; "The rational decision process in salmon migration," by Bernard C. Patten; "A comparison among selected marine species of an association between sea water temperature and relative abundance," by Robert L. Dow; and "Breeding and gonadal cycle of oysters in Loch Ryan, Scotland," by R. H. Miller.

Oceanography and Marine Biology. An Annual Review, vol. 1, edited by Harold Barnes, 478 pp., printed, 1963, 75s. (about US\$10.50). George Allen and Unwin, Ltd., 40 Museum St., London WC1, England.

U. S. S. R. *Oceanographic and Marine Studies*, OTS 63-31798, 73 pp., printed, September 20, 1963, \$2. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

OREGON:

Biennial Report to the Governor and the Fifty-Second Legislative Assembly, July 1, 1960-June 30, 1962, 34 pp., illus., printed. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland

1, Oreg. How the Fish Commission is organized, what it is doing to discharge its statutory responsibilities to the resource and to the people of Oregon, and the highlights of its operation during the biennium from July 1, 1960, to June 30, 1962 form the basis of this report. It contains information on: work of the Administrative, Engineering, Research, and Fish Culture Divisions; the Service Recognition Program; Suggestion Awards Program; and other topics. Also included are statistical tables giving data on: liberations of salmon and steelhead trout into State waters; number of eggs taken at Fish Commission hatcheries; landings of food fish and shellfish; commercial fishing licenses issued; and fisheries law enforcement.

OYSTERS:

"Winter hits the oyster industry," article, *New Scientist*, vol. 20, October 3, 1963, pp. 10-11, printed. Harrison, Raison and Co. Ltd., Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

PHYSIOLOGY:

"Measurements of swimming speeds of yellowfin tuna and wahoo," by Vladimir Walters and Harry L. Fierstine, article, *Nature*, vol. 202, no. 4928, April 11, 1964, pp. 208-209, illus., printed, single copy 4s. (about 60 U.S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

PLANKTON:

"The wonderful world of plankton," by Donald J. Hall, article, *The Conservationist*, vol. 18, no. 5, April-May 1964, pp. 22-25, illus., printed. The Conservationist, Rm. 335, State Campus, Albany, N. Y.

PORPOISES:

"On the experience gained in commercial fishing for porpoises," by A. I. Petrenko, article, *Rybnoe Khoziaistvo*, vol. 38, no. 3, 1962, pp. 44-48, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

PREDATOR CONTROL:

"A method for the analysis of chlorinated benzenes in clams (*Mercenaria mercenaria*) and oysters (*Crassostrea virginica*)," by N. Schwartz and others, article, *Journal of the Association of the Official Agricultural Chemists*, vol. 46, October 1963, pp. 893-898, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

PRESERVATION:

Handling and Preservation of Fish, Report on the Work of Torry Research Station and Humber Laboratory, 24 pp., printed, 1962. Torry Research Station, Aberdeen, Scotland. Reviews the history and work of the Torry Research Station and its subsidiary, the Humber Laboratory, Hull, England. The Torry Station conducts research mainly in the fields of fish handling, processing, preservation, and transportation. The Humber Laboratory handles problems related to the distant-water fisheries and the Humber fishing ports. The two stations are fully integrated. Reference to work at Torry should be understood to include the Humber Laboratory as well.

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PROTEIN:

"Fish hydrolysates. III--Influence of degree of hydrolysis on nutritive value," by N. V. Sripathy and others; "IV--Microbiological evaluation," by M. A. Krishnaswamy and N. L. Lahiri, articles, *Journal of Food Science*, vol. 28, May-June 1963, pp. 358-369, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Protein solubility as influenced by physiological conditions in the muscle," by R. N. Sayre and E. J. Briskey, article, *Journal of Food Science*, vol. 28, November-December 1963, pp. 675-679, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Proteins in fish muscle. 18--Sedimentation patterns of myosin-B extracts of prerigor cod muscle," by J. R. Dingle and others, article, *Canadian Journal of Biochemistry and Physiology*, vol. 41, September 1963, pp. 1915-1926, printed. National Research Council, Sussex St., Ottawa, Canada.

"Study of fish serum proteins by starch-gel electrophoresis," by Andree Drilhon, article, *Chemical Abstracts*, vol. 57, December 10, 1962, 15624d, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

QUALITY:

"Significance of the variations in the content of nucleotides, free amino acids, and carbohydrates of the fish muscle in judging quality," by F. Bramstedt, article, *Fette, Seifen, Anstrichmittel*, vol. 64, September 1962, pp. 820-825, printed in German. Industrieverlag von Hernhausen K. G., 24 Rodingsmarkt, Hamburg II, Germany.

"Sulphydryl groups as an index of changes in fish tissue during refrigeration," by N. A. Golovkin and L. I. Pershina, article, *Chemical Abstracts*, vol. 56, June 25, 1962, 15894a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

RADIATION PRESERVATION:

Low-Level Radiation Preservation of Fishery Products, October 1960-October 1962, by Joseph W. Slavin, Maynard A. Steinberg, and Thomas J. Connors, TID-18285, 37 pp., printed, April 1963, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Study of Irradiated-Pasteurized Fishery Products, October 1, 1962-September 30, 1963, by Joseph W. Slavin and Louis J. Ronsivalli, 82 pp., illus., printed, November 1963, \$2. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

REFRIGERATION:

Refrigeration in Fishing Vessels, by G. C. Eddie, Torry Memoir No. 58, 8 pp., printed, 1961. Torry Research Station, Aberdeen, Scotland.

RESOURCES:

Plan for Development of the Land and Water Resources of the Southeast River Basins, 183 pp.; Appendix 1--Savannah Basin, 211 pp.; Appendix 2--Ogeechee Basin, 146 pp.; Appendix 3--Altamaha Basin, 177 pp.; Appendix 4--Satilla-St. Marys Basin, 170 pp.;

Appendix 5--Suwannee Basin, 159 pp.; Appendix 6--Ochlockonee Basin, 183 pp.; Appendix 7--Apalachicola-Chattahoochee-Flint Basins, 226 pp.; Appendix 8--Choctawhatchee-Perdido Basins, 176 pp.; Appendix 9--Economics, 243 pp.; Appendices 10 & 11--Hydrology; Engineering and Cost, 145 pp.; Appendices 12 & 13--Planning; History and Organization of the Commission, 276 pp.; illus., printed, 1963. United States Study Commission, Southeast River Basins, Box 953, Atlanta 1, Ga.

SALMON:

"Eighth progress report on salmon diet experiments," by Thomas B. McKee and others, article, *Research Briefs*, vol. 9, no. 1, May 1963, pp. 52-56, printed. Fish Commission, 307 State Office Bldg., 1400 SW 5th Ave., Portland, Ore. 97201.

"Ninth progress report on salmon diet experiments," by Wallace F. Hublert and others, article, *Research Briefs*, vol. 9, no. 1, May 1963, pp. 57-62, printed. Fish Commission, 307 State Office Bldg., 1400 SW 5th Ave., Portland, Ore. 97201.

The Salmon King of Oregon (R. D. Hume and the Pacific Fisheries), by Gordon B. Dodds, 271 pp., illus., printed, 1959, \$6. The University of North Carolina Press, Chapel Hill, N. C. This year (1964) marked the designation of the site of the first Pacific Coast salmon cannery (built in Sacramento, Calif., 100 years ago) as a National Historic Landmark. Because of the renewed interest in the early history of the Pacific Northwest salmon canning industry, it is fitting that attention be called to this book even though it was published several years ago. This is not really a full biography because, as the author points out, the necessary records are missing. But it is an economic history of the salmon canning industry in Oregon. Hume was a salmon canner of prominence and an early apostle of conservation. He was a member of the pioneer family in the salmon industry and an innovator in developing the techniques of the trade. The author admits that the scale of Hume's operations was much smaller than that of his competitors on the Columbia River, but his problems were the same as those of the larger cannery operators. It seems that the vicissitudes facing the salmon canner today are still exactly the same as those facing Hume: relentless competition; the search for larger domestic and foreign markets; relations with distant commission men; the supply of salmon; and securing of labor. But Hume had one more problem which no longer faces today's canner--the difficulty of manufacturing reliable cans. You will find on reading this book that Hume's solutions to the problems mentioned "were vigorous, imaginative and colorful." What Hume lacked in scientific knowledge of salmon he made up with inventiveness. Some of the first experiments in the artificial propagation of salmon were conducted in his own hatcheries. Hume erected an economic complex on the Rogue River in southwestern Oregon based upon his control of fishing rights on the river. Hume's career is significant not only because of what he himself accomplished, but also because it exemplifies so well the beliefs of his era in mechanical inventiveness, economic monopoly, progress, and the sanctity of wealth and business. The chapters in the book deal with Hume's migration from Maine to the Columbia, and to Oregon; the Rogue River salmon; the monopoly Hume developed; Hume

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the politician; the trials of a hatcheryman; his attempts to influence public opinion and to expand his empire; and the last chapter discusses the man and the times he lived in. Quite interesting is the appendix which gives the salmon pack on the Rogue River from 1877 through 1908. The book contains a good bibliography, and an index. This study tries to fill some gaps in American economic history, more specifically the activities of the frontier capitalist and businessman-conservationist in developing the salmon canning industry of the Pacific Northwest. Here is a book that makes fascinating reading. It is an excellent addition to the library of any one interested in the early history of commercial salmon fishing and canning.

--Joseph Pileggi

SALT FISH:

"Accelerated cooling of wet, heavily salted fish," by A. L. Wood, article, *Journal of the Fisheries Research Board of Canada*, vol. 20, July 1963, pp. 997-1,000, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

SANITATION:

"Bacteriological survey of filleting processes in the Pacific Northwest. I--Comparison of methods of sampling fish for bacterial counts," by Wayne I. Treitsven, article, *Journal of Milk and Food Technology*, vol. 26, September 1963, pp. 302-306, printed. International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

"Increase in resistant strains on fish container during CTC-icing, and reduction of bacterial load on wooden container with bactericides," by Tetuo Tomiyama, Yasuo Yone, and Etsuko Shiraishi, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 28, October 1962, pp. 1028-1042, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

SARDINES:

"Night-caught and day-caught larvae of the California sardine," by John D. Isaacs, article, *Science*, vol. 144, no. 3622, May 29, 1964, pp. 1132-1133, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

SAURY:

"Phototaxis of saury. I--Vitamin A of fish eye," by Yarakuro Yamamura and Seiichi Muto, article, *Chemical Abstracts*, vol. 59, November 11, 1963, 11942f, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

SEAWEED:

"Studies on soluble alginates. II--The pH of soluble alginates including lithium alginate, sodium alginate, potassium alginate and ammonium alginate," by Miki Oguro, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 12, May 1961, pp. 88-92, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

SHARKS:

"Composition and palatability of porbeagle flesh," by W. J. Dyer and D. I. Fraser, article, *Journal of the*

Fisheries Research Board of Canada, vol. 20, September 1963, pp. 1153-1158, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

SHRIMP:

"Occurrence of two penaeid shrimps, *Artemisia longinaria* (Bate) and *Hymenopenaeus mulleri* (Bate), and some lesser-known shrimps in coastal waters of South America," by M. N. Mistakidis and G. de S. Neiva, article, *Nature*, vol. 202, no. 4931, May 2, 1964, pp. 471-472, printed. St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

SMALL BUSINESS MANAGEMENT:

Management Staffing in Small Business, by Howard V. Finston and Karl Christman, Management Research Summary, 2 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416. The study reported in this summary examines the practices followed in the selection, development, and retention of executives by some rapidly growing small businesses in New Mexico.

Success or Failure of New Small Manufacturers, by

William M. Hoad and Peter Rosko, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Why do some new manufacturers succeed while others fail? The study reported in this summary sought answers to this question in a 3-year study of 95 new small manufacturing businesses. Successful firms were often characterized by (1) two or more executives with different backgrounds; (2) experienced management--five years or more in managerial functions; (3) highly educated management; (4) consultations before and after starting the business; (5) use of management tools such as budgets and controls; and (6) establishment of definite, realistic objectives before committing funds. Failure was often caused by inadequate training, experience, or ability on the part of the management.

Using Security to Get a Bank Loan, by Leonard J. Kon-

opa, Small Marketers' Aid No. 102, 4 pp., processed, April 1964. Small Business Administration, Washington, D. C. 20416. Sometimes the small marketer's signature is the only security the bank needs when making a loan. At other times, the bank requires additional assurance that the money will be repaid. The kind and amount of security depends on the bank and on the small business owner's situation. Among the types of security discussed in this report are: endorsers, comakers, and guarantors; assignment of leases; trust receipts for floor planning; savings accounts; and life insurance policies.

SPAIN:

Nombres vulgares y científicos de las principales especies comerciales de peces de la región sudatlántica española (Common and scientific names of the principal commercial fish species of Spain's South Atlantic coast), by Julio Rodríguez-Roda, 17 pp., illus., printed in Spanish, 1960. (Reprinted from *Investigación Pesquera*, vol. 22, November 1960, pp. 109-125.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

SPOILAGE:

"Bacteriology of spoilage of fish muscle. II--Incidence of spoilers during spoilage," by R. Adams, L. Farber,

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and P. Lerke, article, Applied Microbiology, vol. 12, no. 3, May 1964, pp. 277-279, illus., printed, single copy \$3. The Williams & Wilkins Co., 428 E. Preston St., Baltimore, Md. 21202.

"Factors influencing the keeping quality of fresh-water fish in ice," by N. L. Lahiry, M. N. Moorjani, and B. R. Baliga, article, Food Technology, vol. 17, September 1963, pp. 123-125, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

STERN TRAWLERS:

"Fishing equipment and technique for a refrigerated stern trawler," by F. W. Jenckel, article, Schiffbautechnik, vol. 12, 1962, pp. 540-555, printed in German. VEB Verlag Technik, 13/14 Oranienburgerstrasse, Berlin C2, Germany.

"Refrigerated stern trawler," article, Schiff und Hafen, vol. 14, no. 10, 1962, pp. 867-888, printed in German. C. D. C. Heydorns Buchdruckerei, Uetersen bei Hamburg, Germany.

STRIPED BASS:

"Hopes high for striped bass hatchery," by Otho May, article, South Carolina Wildlife, vol. 11, no. 2, Spring 1964, pp. 14-15, illus., printed. South Carolina Wildlife Resources Department, Box 360, Columbia, S. C.

TOXICITY:

"Separation and purification of toxic constituent of swellfish," article, Chemical Abstracts, vol. 56, April 2, 1964, 7684a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Source of paralytic shellfish toxin in the Bay of Fundy," by A. Prakash, article, Journal of the Fisheries Research Board of Canada, vol. 20, July 1963, pp. 983-996, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Studies on the food poisoning caused by aquatic foods. I--Preliminary survey on toxic substance of octopus which caused food poisoning," by Yoshihiro Sato, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, March 1963, pp. 263-266, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gandori 6, Minato-Ku, Tokyo, Japan.

TOXINS:

"Tarichatoxin-tetrodotoxin: A potent neurotoxin," by H. S. Mosher and others, article, Science, vol. 144, no. 3622, May 29, 1964, pp. 1100-1110, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. A nonprotein substance isolated from the California newt is the same as the toxin from the puffer fish.

TRAWL NETS:

The Study of the Mesh Selection of Trawl Nets, with Special Reference to the Mesh Regulation on the Japanese Trawl Fishery in the East China and the Yellow Seas, by Tsuneo Aoyama, Fisheries Research Series No. 2, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.

TROUT:

"Fat oxidation and storage life of iced trout. I--Influence of gutting," by Poul Hansen, article, Journal of the Science of Food and Agriculture, vol. 14, November 1963, pp. 781-786, printed. The Society of Chemical Industry, 14 Beilgrave Sq., London SW1, England.

TUNA:

"Biochemical studies on tuna. IV--Effect of cold storage on the base composition of testis deoxyribonucleic acid (DNA)," by Yutaka Fuji, Koichi Mimoto, and Shichiro Higasa, article, Chemical Abstracts, vol. 57, November 26, 1962, 14301a, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Biología del Atun, THUNNUS THYNNUS (L.) de la costa sudatlántica de España (Biology of the bluefin tuna, Thunnus thynnus (L.), of Spain's South Atlantic coast), by Julio Rodríguez-Roda, 114 pp., illus., printed in Spanish with English summary, 1964. (Reprinted from Investigación Pesquera, vol. 25, January 1964, pp. 33-146.) Instituto de Investigaciones Pesqueras, Paseo Nacional, s/n, Barcelona-3, Spain.

TUNALIKE FISH:

Japansk Bonito- og Tunafiske (Japanese Bonito and Tuna Fishing), by Torolf Holme, Fiskeridirektoratets Skrifter, Serie Fiskeri, vol. 5, no. 1, 1964, 77 pp., illus., printed in Norwegian with English summary. A. S. John Griegs Boktrykkeri, Bergen, Norway.

U. S. S. R.:

Rybnoe Khoziaistvo, vol. 40, no. 4, April 1964, 95 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U. S. S. R. Includes, among others, these articles: "Basic trends of technical progress in the fishing industry during 1966-1970;" "Biology and fisheries for basic fishes of southern Atlantic," by S. O. Overko; "Fishing areas off eastern Greenland," by L. N. Pechenik and M. V. Mina; "Present condition and future development of fishery ports," by I. A. Kunitskii; "Ocean perch and herring trawl operations of the SRTR Uliss," by G. Grishchenko; "Use of electric current in the harvesting of seals," by B. I. Badamshin and others; "Gleb Uspenskii, a large stern trawler;" "Agar from Black Sea gelidium algae," by A. A. Kalugina; "The fishing industry of the U. S.," by A. B. Kuz'mychev; and "Second session of the Mixed Commission on Cooperation in Marine Fisheries (Soviet Union, Poland, and East Germany)."

--M. A. Kravtsov

Rybnoe Khoziaistvo, vol. 40, no. 5, May 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U. S. S. R. Includes, among others, these articles: "The development of a large chemical industry and technical progress in the fishing industry," by V. P. Zaitsev; "Our first experience with new fishery regulations," by E. N. Kazanchev; "The characteristics of fishing for white whales and regularity of their distribution in the Arctic," by D. A. Butorin; "Purse-seining for halibut and other bottomfish in the waters off Kamchatka,"

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

by I. A. Polutov and others; "Selection of infrared thermo-emanator in warm processing of fish," by N. N. Sakharova and E. I. Mellekh; "Objective method of determining the degree of fat acidity in salted herring," by L. A. Liubavina; "Chemical composition and possible processing techniques for Far Eastern molluscs," by D. Ia. Ertel; "Possibilities of increasing the efficiency of operation of large stern trawlers (BMRT)," by N. S. Iukhno and V. A. Tepitskii; "Soviet-Ghanaian agreement on cooperation in marine fisheries;" and "Physical principles of fish detection," by I. Kliukin.

--M. A. Kravanja

VIET-NAM:

Foreign Trade Regulations of Viet-Nam, by Nandor J. Cheplo, OBR 64-49, 8 pp., printed, May 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Viet-Nam's chronic imbalances in foreign trade, low level of exchange reserves, and need to stimulate industrialization are important factors in the Government's restrictive trade policy. This report contains information on the import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also discusses nontariff import trade controls, Viet-Nam's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

VITAMIN A:

"Effect of processing on the vitamin A content of some Nile fishes," by S. R. Norcos and M. K. Saleh, article, Chemical Abstracts, vol. 59, August 5, 1963, 3261b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

"Studies on the mechanism of consumption and accumulation of vitamin A in fish (Part II)," by Yaro-kuro Yamamura, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, January 1962, pp. 39-44, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-Ku, Tokyo, Japan.

WHALE OIL:

"Food additives. Hydrogenated sperm oil," article, Chemical Abstracts, vol. 57, December 10, 1962, 17144b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

WHALES:

"Flavour of beef and whale meat," by Irwin Hornstein, Patrick F. Crowe, and William L. Sulzbacher, article, Nature, vol. 199, September 28, 1963, pp. 1252-1254, printed. St. Martin's Press, Inc., 175 Fifth Ave., New York, N.Y. 10010.

"Movement of humpback whales marked in the South West Pacific Ocean 1952 to 1962," by W. H. Dawbin, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 68, 70-74, 76-78, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

"Properties of components of myoglobin of the sperm whale," by M. Z. Atassi, article, Nature, vol. 202, no. 4931, May 2, 1964, pp. 496-498, illus., printed. St. Martin's Press, Inc., 175 Fifth Ave., New York, N.Y. 10010.

"Reprocessing of whale fat into edible hydrogenated fat," by T. A. Khorin, article, Chemical Abstracts, vol. 58, January 7, 1963, 876e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D.C. 20006.

WHALING:

"Antarctic season 1963/64," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 3, March 1964, pp. 78, 80-81, printed in Norwegian and English. Hvalfangerforeningen, Sandefjord, Norway. In the season 1963/64, 16 factoryships took part in pelagic whaling operations in the Antarctic. This was one less than in the previous season; the British factoryship Southern Harvester, sold in 1963 to Japan, did not participate in the operations. The International Whaling Commission had resolved at its meeting in 1963 to give total protection to the blue whale in all but one Antarctic area. The humpback whale was totally protected. Further, the Commission fixed the maximum catch for season 1963/64 at 10,000 blue-whale units, where the "ceiling" had been 15,000 units in the previous season. The season lasted from December 12 to April 7 for fin and sei whales, and from February 1 to April 7 for blue whales. Included in this article are statistical tables showing the Antarctic catch by country in the past 3 seasons; catch by blue-whale units, 1963/64; blue whale catches for the past 3 seasons; and production of whale and sperm oil by fleet.

YELLOWTAIL:

Notes on the Ecology and Fisheries of the Yellowtail SERIOLA QUINQUERADIATA T. et S., of the Japanese Waters, by Fumio Mitani, Fisheries Research Series No. 1, 43 pp., illus., printed in Japanese. Japan Fisheries Resources Protection Association, Tokyo, Japan.



"RIVERS OF MUD" AT BOTTOM OF SEA

A series of mammoth "sea channels" carved out of the bottom of the ocean by gigantic "rivers of mud" have been found by United States scientists. Their findings were made public on July 26, 1964, by the Director of the Coast and Geodetic Survey (C. & G. S.), U. S. Department of Commerce. He reported that the "sea channels" were located in the Bay of Bengal.

The findings resulted from a study made by the C. & G. S. oceanographic research vessel Pioneer. The 312-foot "floating laboratory" is participating in a 20-nation study of the Indian Ocean, scientifically one of the least known areas of the world. Its 27,000-mile cruise ended August 11 when it returned to its home base of Oakland, Calif., after an absence of six months.

The study was conducted by three oceanographers -- 2 from the Coast and Geodetic Survey, and 1 from the Scripps Institution of Oceanography. They reported that at least a score of the "sea channels" was discovered on the bottom of the Bay of Bengal off the southern coast of India.

"These channels are of enormous dimensions," said one of the oceanographers. "The largest surveyed by our scientists, located about 2 miles below the surface of the sea, was about 4 miles wide and 300 feet deep. We estimated that it carried a volume of water 25 times larger than that of the Mississippi River. We followed it for about 200 miles before we lost it." The Mississippi River is about a mile wide and up to 50 feet deep. The oceanographer said the channels were apparently dug out of the sea bottom by "gigantic rivers of mud."

"Over the years," he said, "the many rivers which pour into the Bay of Bengal, including the Ganges, Iraquadi, and Brahmapoutra, deposit their mud on the continental shelves, a connecting link with the ocean bottom which begins at the water's edge. Possibly about once or twice each century, this mud suddenly moves with compelling force from the shelves across the bottom of the sea through these huge channels. What triggers these sudden avalanches of mud at the bottom of the sea is not known.

"But the mud is apparently funneled down submarine channels cut into the steep continental slopes, which link the continental shelves and the ocean bottom, and pours across the almost flat sea floor for hundreds of miles. At some time in the distant past, the mud avalanches cut these enormous channels out of the sea bottom.

"Each time this unusual phenomenon occurs, it fills the sea channels to overflowing with huge, massive, fluid rivers of mud. The volume is so great that in overflowing the channels it builds its own levees or walls, just as the Mississippi River does on land. These mud rivers run along the bottom of the sea like a flood of mercury. We don't know how long these avalanches last. We believe they travel at high speed and their volume is measured in millions of cubic yards of mud. They represent a truly remarkable phenomena of the sea."

The C. & G. S. oceanographer said the channels are to be found as far as 500 miles from shore.

Scientists knew before that deep-sea floor channels existed, but the impression up to now has been that they represented a series of structural faults in the ocean bottom. Only a few had been located in the Bay of Bengal.

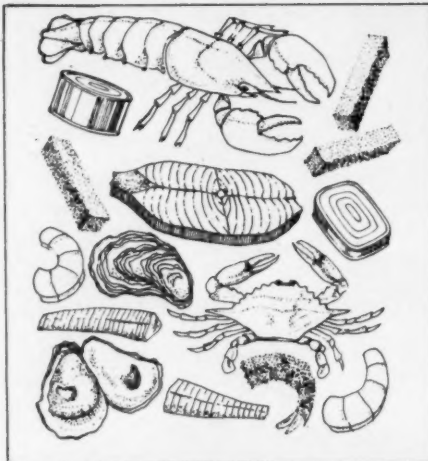
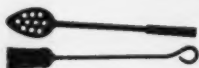
"Our study definitely established," declared the scientist, "that these channels are not structural faults, that they were caused by rivers of mud, that they represent a complex system rather than the isolated 2 or 3 we believed existed before. These sea channels in the Bay of Bengal represent the greatest network and the greatest display of these unusual features found anywhere so far. This is undoubtedly one of the major discoveries of our expedition."

The Pioneer spent two weeks studying the sea channels. (News Release, July 26, 1964, Coast and Geodetic Survey, U. S. Department of Commerce.)

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